The American School Board Journal

A Periodical of School Administration

November 1961

Reducing the Time Lag in Educational Progress, Kowitz 9

Boulder Measures Quality of Instruction, Burbank 12

The Robert E. Lee High School, Biu 13

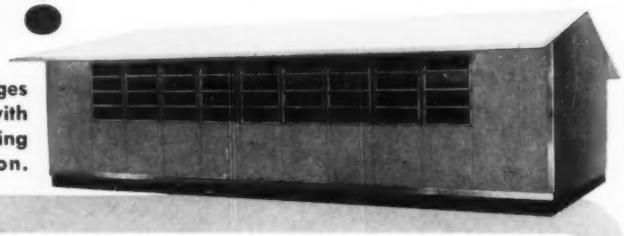
Planning a School Fallout Shelter . 28

SPECIAL REPORT:

Planning High Schools, Lovewell . 24

extra classrooms
NOW!

Will you have unanticipated classroom shortages this fall? Add extra facilities in just days . . . with PANELFAB RELOCATABLE CLASSROOMS! featuring aluminum-honeycomb, panel construction.



Your Fall registration may be larger than previously estimated. It happens all too frequently in this era of shifting and exploding population. You no longer have to resort to double shifts and over-crowded classrooms while construction is rushed on additional facilities — often at excessive costs that wipe out the savings effected through careful planning. Fortunately, Panelfab has your solution to problems of this nature . . .

economical, standard-size, factory-stocked Panelfab classrooms are available for prompt shipment!

For example, our popular 20' x 35' size (700 sq. ft. of usable classroom space) unit is available now! Each unit is complete—cheerful mist green interiors, golden-yellow exteriors (permanent acrylic baked enamel finishes); 18 windows — awning or jalousie — for proper ventilation and lighting; 3' and 6' roof overhangs to serve as covered walkways; even electric raceway systems! You'll be surprised how luxurious, how spacious, how handsome, how permanent these classrooms are! And, if your specific requirements necessitate customized classrooms, Panelfab's experienced engineers and architects can solve this problem for you with equal speed!

PANELFAB®
PRODUCTS, INC.

IN ADDITION, PANELFAB RELOCATABLE CLASSROOMS OFFER ALL THESE QUALITY FEATURES:

- **Completely insulated** for all-weather comfort, low cost heating!
- **Maintenance-free** and vermin proof . . . no fumigating, no rotting, no piece-by-piece replacement of siding and roofing . . . easy to clean, requires almost no maintenance!
- **Hurricane tested for structural safety:** Panelfab classrooms have actually withstood hurricane force winds while conventionally built structures were destroyed!
- **Fire resistant:** Panelfab classroom units have earned a Flame Spread Rating of Zero from a qualified independent research institute.
- **Speedily constructed:** Can be erected in a matter of days — even by your own maintenance crews!
- **Portable:** Extremely light-weight Panelfab Relocatable Classrooms may be dismantled with ease for speedy transportation and re-erection or storage! May also be moved without disassembly due to unique structural strength.
- **Versatile, permanent:** Though truly portable, Panelfab Classrooms are built for solid permanent placement. Standard units may be linked together with ease to allow extra space for any curricular need — can even double the size of your school at minimal cost!
- **Building Code Approved**

standard sizes are ready for prompt shipment—however Panelfab's engineering and architectural specialists are available upon request to take care of specific requirements . . .

MAIL THIS COUPON TODAY

PANELFAB PRODUCTS, INC.
2056 N.E. 146th STREET, NORTH MIAMI, FLORIDA

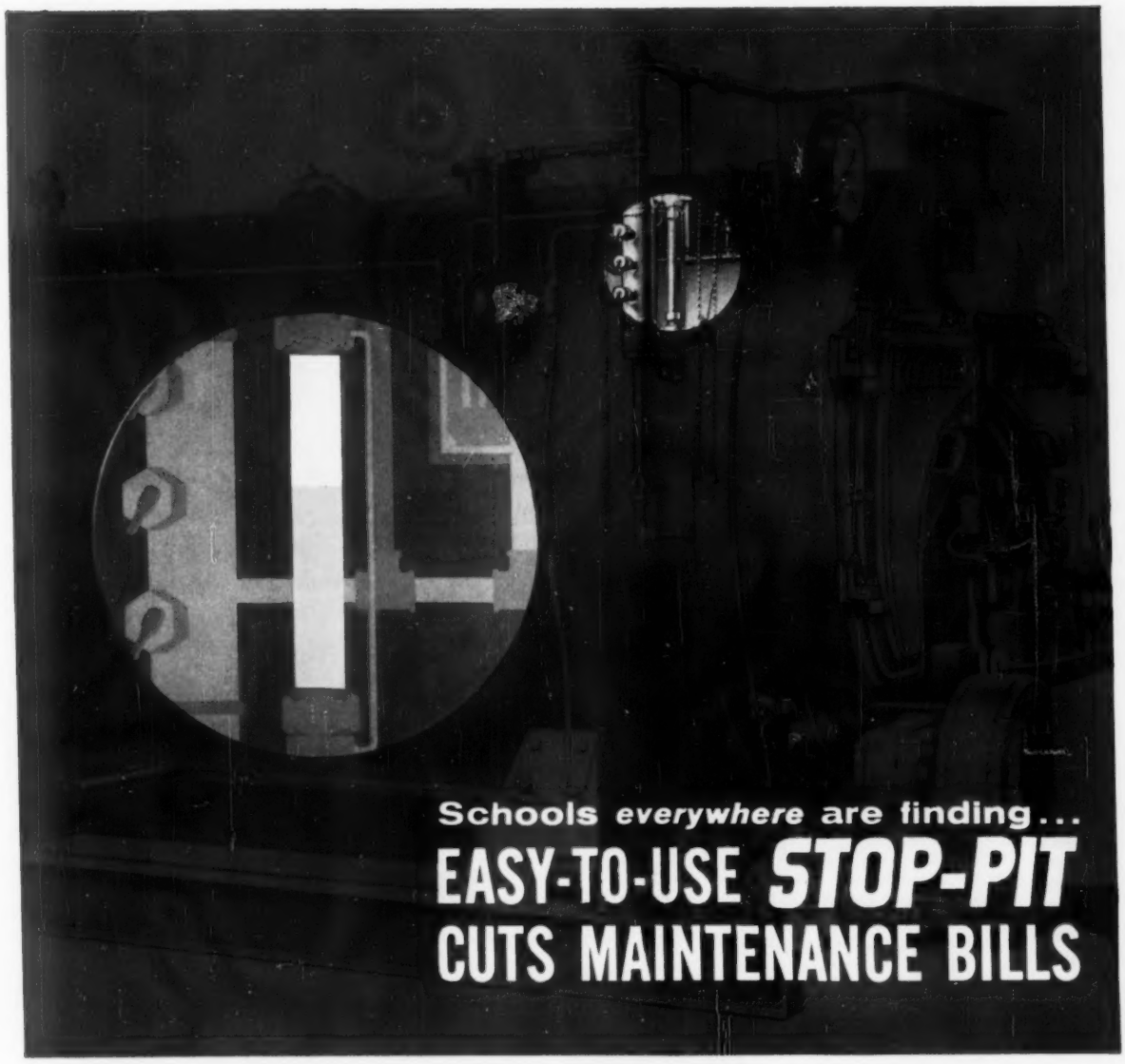
Gentlemen: ☐ Please send full particulars on the many advantages of the Panelfab Relocatable Classroom. ☐ We have immediate requirement, please send Panelfab representative at once.

NAME.....

ADDRESS.....

CITY.....ZONE....STATE.....

(For more information from advertisers, use postcard on page 45)



In the Joliet, Illinois school system . . . in Erie, Pa. . . . in Paducah, Ky. . . . in Rutgers University . . . yes, in schools everywhere, those charged with heating system maintenance get more efficient operation, fewer breakdowns, sharply lower repair costs, with STOP-PIT, newest water treatment development from Dearborn's research laboratories. ■ STOP-PIT protects costly boilers and heat circulating systems against destructive scale and corrosion . . . improves performance and efficiency. It's economical . . . easy to use . . . requires no chemical or engineering knowledge. Built-in color indicator tells you how much to use . . . when to add more. ■ Yet it contains the same, time-tested ingredients that industrial corrosion engineers use to protect their costly high-pressure steam generating equipment and their extensive condensate return systems . . . and reflects the same water treatment know-how that has made Dearborn a leader in this field for 75 years. ■ Why not be sure, this winter, that *your* heating system has STOP-PIT protection? Send for details today. Or call your nearest Dearborn distributor or representative for full information.

pioneer in the science of corrosion control since 1887

DEARBORN CHEMICAL COMPANY

GENERAL OFFICES: MERCHANDISE MART, CHICAGO 54 • DALLAS • DES PLAINES, ILL. • FT. WAYNE • HONOLULU
LINDEN, N.J. • LOS ANGELES • NASHVILLE • OMAHA • PITTSBURGH • TORONTO • HAVANA • BUENOS AIRES

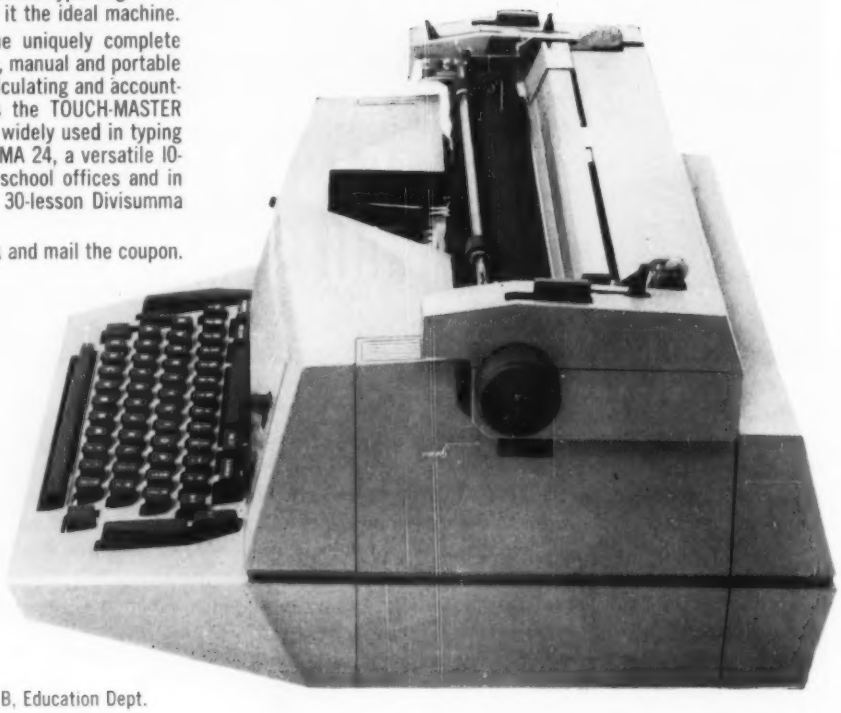
(For more information from advertisers, use postcard on page 45)

underwood FORUM

This new Underwood electric typewriter with interchangeable polyethylene carbon and conventional fabric ribbons is well-suited to school office use. FORUM-typed letters have a crisp clarity and precise beauty that makes for easy, pleasant reading. For stencils or reproduction material, the FORUM's perfect type alignment and color uniformity make it the ideal machine.

The FORUM is part of the uniquely complete Underwood line of electric, manual and portable typewriters and adding, calculating and accounting machines. It includes the TOUCH-MASTER FIVE, a manual typewriter widely used in typing courses, and the DIVISUMMA 24, a versatile 10-key calculator for use in school offices and in conjunction with the new 30-lesson Divisumma Office Practice Course.

For full information, check and mail the coupon.



underwood Corporation, Section B, Education Dept.
One Park Avenue, New York 16, N. Y.

Without obligation, please send information on

- ☐ Underwood supplies
- ☐ Underwood calculators
- ☐ Underwood typewriters
- ☐ Underwood Typing Teaching Aids

NAME _____

POSITION _____

ADDRESS _____

(For more information from advertisers, use postcard on page 45)

The American School Board Journal

November, 1961 Vol. 143, No. 5

William C. Bruce, Editor

Robert C. Bruce, Editorial Director

Frank Bruce, Publisher

Associate Editor Edward J. Pollock

Assistant Editors

Ann Tompkins, Jeane Hawe

Washington Editor Elaine Exton

Circulation Manager George Sexton

Advertising Production Manager Helen Smrz

New Products Editor Lois Lunz

Advertising Sales

MILWAUKEE 1, WISCONSIN
Charles J. Murray, Gen. Sales Mgr.
400 N. Broadway, BRoadway 1-9700

CHICAGO, ILLINOIS
James T. Callen, Adv. Sales Mgr.
George E. Heiland
William Devlin
20 N. Wacker Drive, STate 2-7530

NEW YORK 7, NEW YORK
Walter T. Hasson or Eugene L. Cleary
233 Broadway, WOrth 4-4071

MIAMI 32, FLORIDA
J. Bernard Cashion, 904 Chamber of Commerce Bldg., FRanklin 1-9941

LOS ANGELES 28, CALIFORNIA
Robert C. Whaley, Whaley-Simpson Co.
6608 Selma Ave., HOllywood 3-7157

SAN FRANCISCO 11, CALIFORNIA
Gordon Simpson, Whaley-Simpson Co.
700 Montgomery Bldg., SUtter 1-4583

THE AMERICAN SCHOOL BOARD JOURNAL, Copyright, 1961, by The Bruce Publishing Company.— All rights reserved. Title registered as Trade Mark in the United States Patent Office. Second class postage paid at the Post Office at Milwaukee, Wis., under the Act of March 3, 1879. Published on the 25th of the month preceding the date of issue by The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis. (The Bruce Publishing Company founded in 1891 at Milwaukee, Wisconsin, with branch offices in New York and Chicago, is in no way identified with Bruce Publishing Co. of St. Paul, Minn.)

SUBSCRIPTIONS. In the United States, Possessions, and Canada, $4.60 a year, payable in advance. Two-year subscriptions will be accepted at $7.00. In all foreign countries, $5.50, two years at $9.00. Single copies, 75 cents. When you have a change of address kindly report it to us at once. Send us your old as well as your new address and be sure the Postmaster is notified. Postal regulations restrict forwarded service on magazines to two issues only. Notice of discontinuance of subscription must reach the publication office in Milwaukee at least 15 days before expiration date.

THE EDITORIAL STAND

Keep Your Heads and Save Your Hides, Lamers 38

SPECIAL REPORT

Planning High Schools, Lovewell 20

An abstract of a guide on construction prepared after the building of the new Monclair High School, Calif.

FEATURES

Reducing the Time Lag in Educational Progress, Kowitz . 9

About the time lag in incorporating technological developments into educational practice.

Boulder Measures Quality of Instruction, Burbank . . . 12

Professionals and laymen recommend improved evaluation to precede merit rating of teachers, principals, and supervisors.

The Junior High School Science Picture, Renner 14

Changes are advocated for general science if it is to be retained in the junior high school.

Substitute Teaching Programs, Bear and Carpenter 16

Two education faculty members prepare a checklist to show the strengths and weaknesses of substitute teaching programs.

THE SCHOOL PLANT

The Robert E. Lee High School, Hitt 18

This air-conditioned new school has a student capacity of 2,200 and features five open landscaped courts in its complex.

Notable New Schools 23

Planning a School Fallout Shelter 28

An architectural firm makes a detailed investigation of making a good schoolhouse serve as a fallout shelter.

Evaluation of School Equipment and Furniture, Comfort . . 30

Part two of a checklist on school equipment and furniture.

Elements of the Functional Classroom Environment, De Bernardis and Doherty 32

A checklist for the design and equipment of the classroom

WORD FROM WASHINGTON

Can the Impacted Areas Program Carry General Aid to Victory?, Exton 35

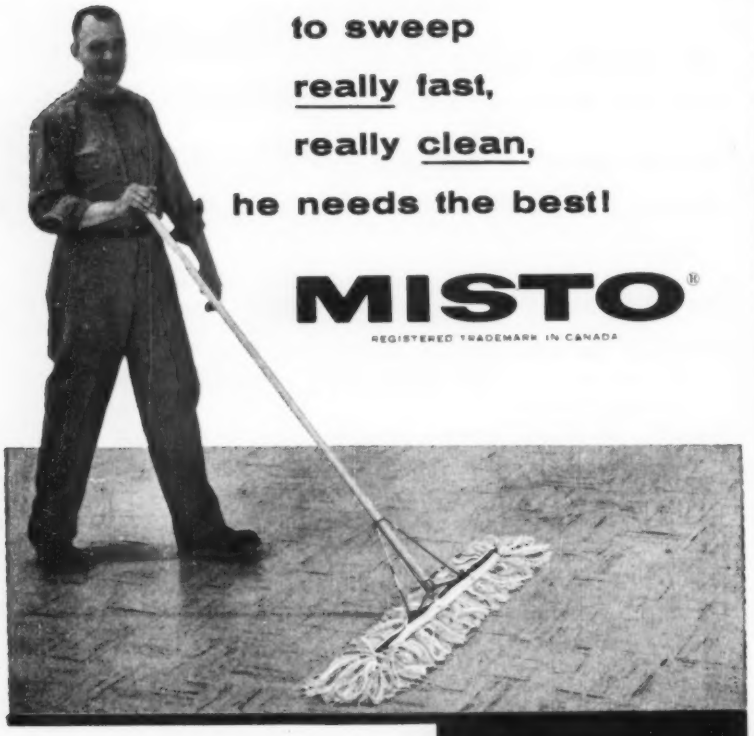
DEPARTMENTS

The School Scene, 4 New Products, 42

Reader's Service Section, 45

OUR COVER

Featured on the cover is a view of the central court of Robert E. Lee High School, Midland, Tex. For details see page 18.

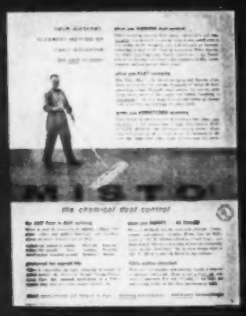


to sweep
really fast,
really clean,
he needs the best!

MISTO®
REGISTERED TRADEMARK IN CANADA

• interested in speed sweeping?
• in cutting your dusting chores?
• in 24-hour dust control?

send for this
FREE new bulletin



ACME CHEMICAL CO. 2506 N. 32nd St. MILWAUKEE 45, WIS.

Please send me your new bulletin on FAST SWEEPING

mail to _____ title _____

school _____

street address _____ route _____ box _____

post office _____ zone _____ state _____

ACME Chemical Company
FOR OVER SIXTY YEARS QUALITY ABOVE ALL
Milwaukee 45, Wisconsin

the school scene

■ If states and communities continue to build classrooms at the present rate, **the classroom shortage reported by the U. S. Office of Education should be over within the 1960's.** according to the Chamber of Commerce of the United States.

The construction rate actually might accelerate, the Chamber said. School bond sales have been setting records. As the economy grows, there will be more taxes for school construction.

But even with the present average construction rate, there would be 159,500 additional new classrooms to be applied against the classroom shortage which, according to the Office of Education, stood at 142,160 for the fall of 1960.

■ **In New Orleans, La., the school board has noted that attendance of white students at three of the six desegregated schools has increased, indicating that efforts to establish a boycott have gone unheeded.** A total of 805 white students and four Negroes attended the three schools. compared with an enrollment last year of 1350. The scene around the schools was quiet and peaceful, and the school officials were convinced that more students would register later.

■ **The Midwest Program on Airborne Television Instruction is well underway.** The program started September 11, when a DC-6 crammed with television equipment took off from Purdue University Airport to begin transmitting educational TV programs into 13,000 classrooms in six states, for the benefit of a million students.

Ford Foundation and private industry are underwriting the test program. which is scheduled to continue until next May. Instruction over this unique network will range from programs for the first grade up to the college level. Curriculums for the program were developed by the Midwest Program on Airborne Television Instruction. Potentially an estimated 7 million students in a 200-mile radius in the six states can be reached.

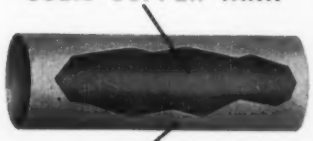
■ U. S. Commissioner of Education Sterling M. McMurrin announced in Washington that **bachelors and higher degrees granted by American colleges**

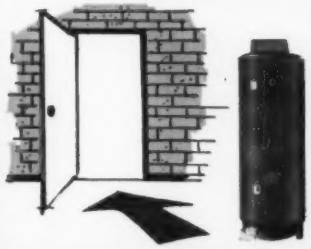
(Concluded on page 41)

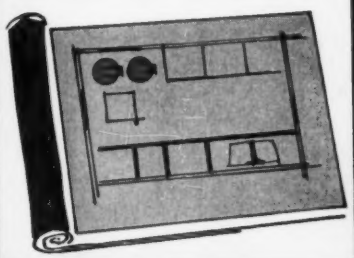
6 reasons why your water heater should be a...

RUUD COPPER SANIMASTER

COMMERCIAL GAS WATER HEATER



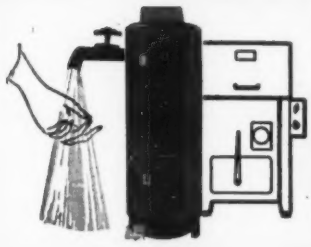


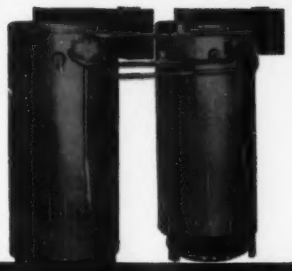


CORROSION CAN'T HAPPEN: Sanimasters were especially built for the high-volume, high temperature needs of your business. The tank is solid copper, reinforced with steel, and all fittings are non-ferrous metal. Rust can't get a toe-hold, anywhere!

NO EXPENSIVE EXTRAS NEEDED: Copper Sanimasters are self-contained, underfired, automatic storage water heaters. They're factory-assembled; fit through standard doorways; need no expensive, on-the-job additions of insulation, circulators, temperature controls, support frames, etc.

INSTALLED AT POINT OF USE: The compact design permits installation of a Sanimaster where you need it. Spot locations save on fuel by eliminating costly heat loss due to long pipe runs. Sanimasters can be installed almost anywhere, with time- and money-saving ease.





HEATS AND STORES 180° WATER CONTINUOUSLY: The Sanimaster, with its all-copper tank, heats and stores water at 180° constantly, steadily supplying sanitizing hot water. With the Duo-Temp Mixing Valve the Sanimaster also delivers general purpose water at the same time.

GROWS EASILY, ECONOMICALLY: When demands increase, simply add another Sanimaster, at less than the cost of replacing an external storage tank. The Ruud Equa-Flow Manifold connects 2, 3, or 4 units; equalizes water flow, yet keeps them working separately.

CARRIES INDUSTRY SEALS: All Ruud Copper Sanimaster Water Heaters are approved-listed by the National Sanitation Foundation: They are also approved by the American Gas Association Laboratories and are constructed in accordance with the A.S.M.E. Boiler and Pressure Vessel Codes.

RUUD

There are nine Ruud Copper Sanimaster Gas Water Heater models. Among them is the style and size exactly right for your hot water needs. Each Sanimaster operates economically on gas, and is warranted for five years. For more information, mail the coupon at right.

RUUD MANUFACTURING COMPANY

A subsidiary of Rheem Mfg. Co.

Manufacturers of commercial and residential water heaters of the highest quality.

FREE FACT-FILLED BROCHURE!

Please send me a free, detailed brochure on the Ruud Copper Sanimaster line of commercial gas water heaters.

RUUD MANUFACTURING COMPANY
7600 S. Kedzie Ave., Dept. NAAS-11
Chicago 52, Ill.

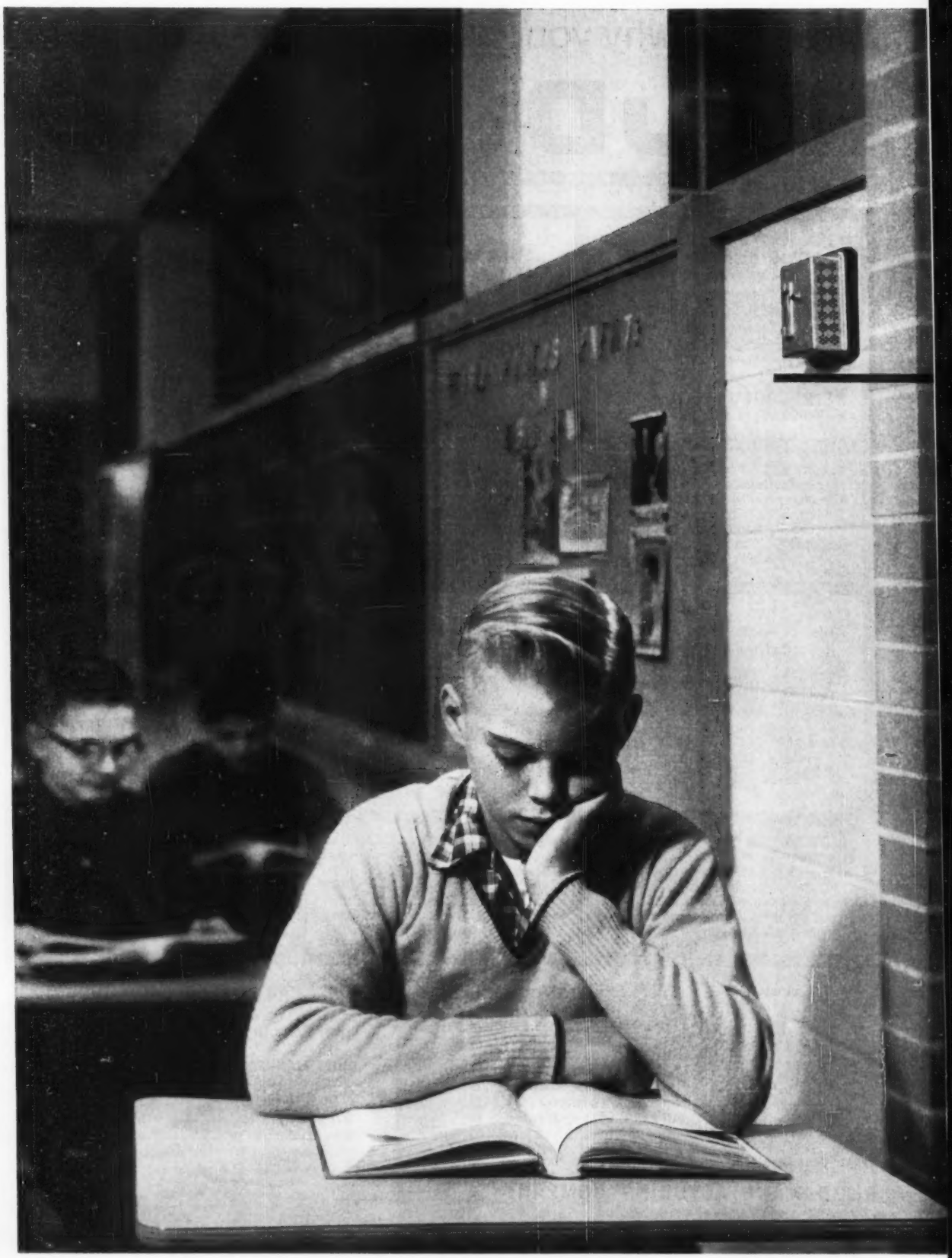
Name_____

Firm Name_____

Address_____

City_____ Zone_____ State_____

(For more information from advertisers, use postcard on page 45)



(For more information from advertisers, use postcard on page 45)

THERMOSTATS

BELONG ON THE WALL

. . . *because* they sense the *true* room temperature out in the room where the students are.

. . . *because* they respond faster to room temperature changes.

. . . *because* they are accessible and can be easily read and adjusted to suit any activity.

. . . *because* they can't be fooled by window down-drafts, air leakage, or cold air off the floor, as often happens to thermostats mounted inside unit ventilators.

. . . *because* they result in fewer complaints and calls for help from teachers.

. . . *because* they are so simple to switch from "night" to "day" comfort levels — an essential feature for after-hours heating economy.

. . . *because* they allow fast, economical early-morning warm-up without overheating.

. . . *because*, when installed by Johnson, they are part of a control system that will outperform, outlast, and, over the life of the building, cost less than any other type of control.

When it comes to your temperature control system, you'll be time and money ahead to rely on the organization which has installed more school thermostats than the rest of the control industry combined . . . Johnson Service Company, Milwaukee 1, Wisconsin. 110 Direct Branch Offices.

JOHNSON CONTROL

PNEUMATIC SYSTEMS

DESIGN • MANUFACTURE • INSTALLATION • SINCE 1885

HOLIDAYS are busy days

in a school that
takes advantage of its "breaks"

Dissatisfied with the way your floors are holding up? Now is the time to switch to Hillyard floor treatments that clean up easily, keep a "first day of school" finish all year long–and cut labor costs as much as 50%.

GYMNASIUMS
CORRIDORS
CLASSROOMS
LOCKER & SHOWER ROOMS
TOILETS
MULTI-PURPOSE ROOMS
ARTS & CRAFTS
HOME ECONOMICS
SHOPS
LIBRARIES
CAFETERIAS
KITCHENS
BOILER ROOMS

The first step–planning. Let the Hillyard "Maintaineer®" give you a specialist's help. Without charge or obligation, he'll survey your floors, recommend treatments, schedule the work, and schedule materials to be on hand as required. He'll suggest latest labor-saving, dollar-saving treatment techniques and demonstrate them to your custodial staff.

If you're not already acquainted with your local Hillyard Maintaineer (he's one of more than 160 trained floor treatment technicians, coast to coast) write us in St. Joseph. Your Maintaineer is.....

"On Your Staff, Not Your Payroll"

To Get the Most from Your Floor Care Dollar...

Plan Ahead with HILLYARD

H I L L Y A R D
Passaic, N. J. ST. JOSEPH, MO. San Jose, Calif.

Branches and Warehouse Stocks in Principal Cities

HILLYARD St. Joseph, Mo. DEPT. E-1
Yes! Please have the Maintaineer get in touch with me at once.

Name .....
School .....
Address .....
City ..... State .....

(For more information from advertisers, use postcard on page 451

The American School Board Journal
November, 1961

Reducing the Time Lag in Educational Progress

GERALD T. KOWITZ

Mr. Kowitz is co-ordinator of experimental programs, New York State Education Department.

Some aspects of the time lag:

1. *Development from theory to practice is time consuming;*
2. *Training of practitioners in the school system may constitute the greatest time lag;*
3. *Commercial interests associated with education are sometimes reluctant to introduce pioneering changes which may or may not be profitable.*

One of the obvious changes in the profession of education is the development of a sense of urgency toward incorporating technological developments into educational practice. To some extent, this is a reflection of a national concern to keep our country in its position of world leadership. Within the profession, administrators and teachers evidence their interest in change and development through their willingness to discuss new designs for education. In fact, one of the most frequent complaints of the professional educator is that he does not have adequate time to keep up with new developments in the field.

These are, of course, constant warnings against changes that are merely fads, and which produce no real differences. Other warnings urge educators that in adopting new methods and equipment they must be sure they are not going to lose the secondary benefits of the traditional procedures. There is a need to define precisely what the new ideas, programs, and equipment can contribute to the educative process and to describe just as carefully what they cannot do. It is unrealistic to expect a new program to continue to do everything the old program did in addition to doing something really new. For instance, while mass production in industry is capable of giving us a standard product at relatively low cost, in doing so many qualities of a hand-crafted product are lost. More frequently than not, the American people have concluded there is a definite advantage in having a standardized product that is readily available over having a product of a somewhat higher quality that is restricted in its availability.

Change in the Modern School

While the problems of change have been a constant topic among professional educators there are some who question whether there have been any real changes in the educative process. They point out that most of the changes that can be observed are a closer kin to swapping blue pills for pink pills than to changing the medicinal content of the pill. There is some truth in this. In spite of everything, the school today is still primarily a place where teachers meet groups of pupils; even with all of the talk about the psychology of individual differences and programs to meet the needs of each whole child, the teaching situation is still essentially one in which a teacher works with a group. The job of the teacher is still largely a matter of presenting material; the job of the pupil is still to learn the material. The final evaluation is done by the teacher and concerns the ability of the pupil to master what has been presented to him.

It is difficult to find contrasts in educational theory, or between theory and classroom practice. While a façade of disagreement exists around some problems, differences are not firmly founded on opposing philosophical positions and staunch defenders of contrasting views are rarely found. Most of the arguments seem to be only attacks upon straw men. Instead of trying to find profit through a critical examination of differences, the goal in education is often togetherness at any price. As a result, discussions produce much more heat than light. Rather than trying to decide which of several possibilities would result in a better education, the concern is with finding some way to move in the direction generally accepted as desirable.

In trying to move practice closer to philosophical goals that are generally accepted, there is a growing awareness of a lag between the development of an idea, of a practice or a technique and the time when the practice is accepted and used in the majority of schools. Observing the time lag school administrators often feel an urge to follow the advice of the industrial manager: "Shoot the engineers and get the blamed thing into production."

The Desire for Change

The desire for change which is urgently felt in the professional field of education today is in part, an aspect of the American tradition of seeking something new. Where educational change has become a virtue, the school

administrator is aware of the problems in securing permission and support from his board of education for introducing new procedures. Ideas alone are frequently very difficult to present. Buildings, equipment, devices, and supplies are much easier to talk about, to show and to demonstrate. As a result, they are easier to sell to the school board. In facing the difficult problems of introducing change into a school system, two rules seem to be emerging: First of all, any change, whether it is in facilities, in the use of equipment, a program of instruction, or an idea on operational procedures, must be translated into language that can be easily understood by the majority of voters in the community. Too often in making the translation from technical and professional language into vernacular, the plan assumes proportions of a panacea. One common result is that both members of the board and parents of the students come to expect that every plan will do all good things for all people. Such an overgeneralization can place the administration in a very embarrassing position when the time comes to evaluate whether or not the change has been truly effective.

The second rule is that the change cannot be too radical. While expected results must have sweeping dimensions, the actual program itself must have very strong resemblance to the current operation. This poses a dilemma for the school operator: How can he meet the demand to do something new that will result in a great improvement in the education of the student but still make no real difference in budget or pattern of operation?

The Time Lag

Simultaneous requirements for real changes and for continuation of known accepted operational patterns focuses attention on the amount of time that seems to be required to move from the idea stage to operation. Generally speaking, today this time lag is seen as an evil, and to be eliminated if possible. Yet a moment of reflection suggests that the time lag serves several important functions. Perhaps the most obvious function of the time lag is to prevent the introduction of practices which although useful at the moment may have undesirable effects over a longer period of time. Other important functions are to allow the development and refinement of techniques, to permit the training of practitioners, to allow the development of an accepting attitude on the part of the public and to provide time for the idea to be related to other activities of the profession. Nevertheless, two questions must be raised: How much of the apparent lag is real and what can be done to speed valuable changes without losing protection of the time lag.

The Time Lag: An Illusion

Beyond the requirements which must absorb some time are several which contribute to the illusion that the lag is much greater than it actually is.

Differences between communities are such that what may be a desirable program for one school may not be even a reasonable program for another. In the field of education there is a tendency to view practices as if they were along a single scale. This ordering, together with differences in practices between communities, produces an illusion of a great time differential.

The tendency to consider educational techniques as mono-dimensional can result in an odd picture of the relation of improvement to time. Rather than forming a linear progression, it seems to double back on itself. For instance, a school administrator who, not too many years ago was arguing against the one-room school, favoring a larger school with age-grade grouping as a means of allowing the teachers to do a better job of meeting individual differences, may now find himself arguing in favor of an ungraded primary unit for the very same reasons. When pressed by members of the community to explain why he now favors what he was against, he may find himself lost in a semantic morass.

Time Lag: a Reality

While the tendency to assume a mono-dimensional progression for educational practices enhances the illusion of a time lag, there is also a real lag. It reflects the time needed to develop an idea which may be quite nebulous to the point where it is useful in a practical school situation. There is a need to understand some of the activities which must occur and which require time in order to occur.

Operational Differences

The development of new techniques that can be used in an operating school from a scientific theory cannot occur instantly. Once a theory has been demonstrated, certain principles can be deduced or inferred. From these fundamental principles emerge suggestions for change in the operation which should improve the results. The course of development from theory to practice inevitably consumes some time.

One common method for hurrying a theory into practice is by equating statistical differences with operational differences. A statistical difference is concerned with the behavior of specific data under carefully controlled conditions. Since operational conditions will rarely correspond precisely to experimental conditions and since the operational concern is more with behavior of the children than behavior of the data, a difference in one does not always result in a difference in the other. It is quite possible for a change to result in a great statistical difference and yet be quite unimportant in the operational situation. Conversely, some factors of great importance to the operational situation cannot be shown to result in statistical differences.

Statistical differences provide leads for the identification of elements of theoretical importance and for validating principles upon which operating programs may be based.

Another statistical term that can have a different meaning to a scientific theory and an operational program is the level of confidence. It should be realized that with our present population of 180 million people, a fact that makes a real difference at the one per cent level of confidence, must by definition, make absolutely no difference to almost two million people. As a result, while the one per cent level of confidence may be quite satisfying to a researcher, it can pose some very real problems to the operator of a public school who must work with the minority as well as the majority.

Training Time

Perhaps the greatest consumption of time is for the training of practitioners. Teacher training has been traditionally oriented to very practical situations. Many studies have shown that teachers do not value courses which require them to think in theoretical, abstract, and futuristic terms, preferring the extremely practical courses such as methods and practice teaching which will help them in their daily work. The very human tendency to be concerned more with the immediate present than with the distant future tends to become habitual, and the practitioner prefers to continue activities that are familiar to him and that he can do easily rather than to embark upon an exploration of new ways. Regardless of whether a new way is really better, the teacher can be certain that it will cause him many difficulties and problems before it is as smooth an operation as his present practice.

Retraining teachers and developing better programs for the training of new teachers is time consuming. It is problematical whether much time can be saved in training without lowering the quality of the product.

The Commercial Dimension

It is important to realize that education has a definite commercial aspect. Publishers of texts, workbooks, and tests, manufacturers of furniture and

audio-visual equipment have large investments in their products. They are sensitive to the commercial market which they serve and are not eager to embark upon pioneering which may or may not be profitable. They have, after all, an obligation to show a profit to their stockholders. Thus, most of the firms engaged in producing educational materials are more interested in making haste slowly than in encouraging rapid change.

Channels for Change

In reviewing pressures for change and obstacles to change, it would seem that the profession of education is almost ripe for establishing channels that would guarantee a maximum of progress. Since no school district can abdicate its responsibility to produce students with a known level of educational skills, there must be precautions to ensure that the desired standards will be continued. Beyond a guarantee of continued quality, the school must be sure that innovations will not have side effects that would interfere with the education of the student.

Since in some ways change is inevitable, there must be ways of implementing the minimax principle — a maximum of improvement with a minimum of danger.

A Posture of Intent

A first requirement for the encouragement of change is an accepting attitude within the profession. In part this exists today.

An attitude of intent to encourage change includes a willingness to examine ideas that do not lie in accepted areas. There must also be a questioning of accepted ideas and traditions. But a willingness to entertain ideas is not enough. There must be some criteria, a set of guides to help judge when a new idea is ready for evaluation and how it should be evaluated.

Philosophy and Prophecy

Given an attitude of intent to entertain change, a fundamental need is to establish channels for philosophy and prophecy. We dare not restrict our thinking to acceptable, practical schemes. These will grow only where the theoretical soil has been well fertilized by unbridled brainstorming and carefully plowed with rigorous, analytical logic.

If we are to have progress, somewhere there must be freedom to follow an idea to its logical conclusion. The history of science is marked by discoveries that solved problems by completely reversing what was commonly believed. Bernoulli solved the dilemma of water pumps by rejecting the obvious, accepted idea that pumps sucked water in favor of the foolish idea that the pressure of the outside air pushed water up the pipe.

There are many problems in education today where common incidents are merely accepted or ignored instead of being pursued to their logical conclusion. For instance, nearly every research into achievement in elementary schools, indicates a real difference between boys and girls. This is particularly true in reading. Yet nowhere has there been a serious attempt to design programs because of this difference. Certainly it seems reasonable that by designing a reading program especially for the critical characteristics of boys, the difference in reading ability between boys and girls could be diminished if not eliminated. If this cannot be done, then some careful thought must be given to adjusting the structure of the school to accommodate the immutable difference between boys and girls.

Before he has followed such thoughts very far, the practical school administrator is forced to call a halt. He has entered an area where the public is not ready for sweeping changes. But not so the philosopher and the prophet. They can follow such ideas, discuss them and argue them. In fact, as they do so, they contribute to the willingness of the public to accept the changes that will eventually be made in the operating program of the school.

Another example can be seen in the role of discipline and punishment in education. At one time, the application of punishment was a major job of the teacher but during the past forty years there has been a continual urging for the school to abandon it completely. While there are indeed many advantages to allowing the child to learn from experience and to suffer the natural consequences of his acts, this is a primitive procedure and almost contrary to the concept of education through planned experiences. On the one hand the time lapse between the incident and its result is often so great that the child never sees the relation between cause and effect. For example, there is nothing in the child's world that can convince him of the importance of skill in reading and of calculating. Recognizing that immediacy of reward is one of the most vital principles of learning, adults introduce expectations and even mild punishment into the child's life so he will acquire these skills long before the child can perceive their true value. Similarly, politeness and good manners, while making a major contribution to the pleasantness of adult life, seem to exist, if at all, as lightly regarded elements of the child's life. Again, it is necessary for the adult to add to the natural consequences before the child will acquire an adequate level of deportment. Along a similar line, it can be argued that unless a person fails, he will move on to a new experience before he has explored all of the nuances of the first situation.

While such ideas do not mandate an immediate return to a strict and severe corporal punishment, they do suggest a careful reconsideration of the role of punishment and failure in the educative process.

Problems like these cannot be entertained in an operational situation nor can they be critically reviewed by persons who are absorbed in the concern of continuing the operation. It is necessary to provide a haven for thought where individuals can explore possibilities and develop their ideas without pressure of the operational situation.

Artificial Aging

In the past, in order for a thought to move from the idea stage to the operational stage it had to first find its way into the literature. In due process of time, it would be discovered by others who were interested in similar things. It would be revised, criticized, and put back into the literature to age some more.

With our present system of libraries, the process of aging is very time consuming and, indeed, a chancy one. A good idea may lie in dust-covered volumes for years before it is exposed to constructive criticism. It should not be difficult to devise methods for increasing the frequency of contacts between minds and ideas which could reduce the time lag by maturing or "aging" ideas more rapidly.

The posture of intent and the problem of aging have an interesting juncture. Under our current procedures, the focus is on improvement of the immediate operation. Frequently we reject an idea simply because we do not see how it would fit into our present operation. Obviously, an artificial aging procedure cannot be this selective. If it is allowed to work only with ideas that are popular and accepted, it cannot be expected to contribute to the development of ideas that allow advances in new directions.

Research and Development

There is a general assumption that an educational program can be tested under scientific conditions and be proved to be good or to be bad. Once a proof has been established, it follows that the program will be accepted by all reasonable people. While this is a very pleasant and comfortable theory, it is not supported by the history of science. Experimental proof is not concerned with demonstrating goodness or usefulness of a program but with the sound-

(Concluded on page 40)

Dr. Burbank former superintendent of schools, Boulder, Colo., recently accepted the position as superintendent of the newly organized Boulder Valley School District. Dr. Burbank is currently vice-president of the AASA.

Boulder Measures

Impelled by suggestions for merit rating, school people and other citizens of Boulder, Colo., moved recently to improve the quality of instructional and administrative services. After a year of study, it was agreed that merit rating should be preceded by major improvements in current methods of teacher evaluation.

The responsibilities of the teacher and the processes required to accomplish the objectives of teaching were analyzed carefully. An instrument was applied to the work of the principal.

The Question of Merit

In the spring of 1957 the board of education appointed a committee of teachers, principals, and people not connected with the public schools, to study merit rating. The members of this group were chosen carefully by cross reference between the board and the teachers' council through a process which resembled jury selection. Every member of the committee was approved by both teachers and the board. Eight teachers, one principal, one co-ordinator, and ten laymen made up the roster.

Not Easy!

The board asked this group to take a long, hard look at the question of merit rating. No direction was given concerning the nature of the recommendations to be reached. The board requested only that the committee study the matter without fear or favor.

Under the able chairmanship of Professor Martin F. Schmidt of the University of Colorado Business School, the project was pursued vigorously throughout the 1957–58 school year. Regular and frequent meetings were held. Numerous consultants and group representatives were invited to testify.

It came as no surprise that the discussions were sometimes heated. By the very nature of the selection process the members represented widely divergent points of view. The study was conducted, however, on a high level of professional co-operation. Differences of opinion were not allowed to degenerate into personal bitterness. As a result, the product at the end of the year was a logical and reasonable answer to the question posed by the board.

Not Ready for Merit Rating

In essence the committee recommended (*a*) that merit rating not be adopted in Boulder at this time, (*b*) that immediate steps be taken to strengthen the procedures by which the work of Boulder teachers is evaluated, and (*c*) that the same action be taken with reference to the work of principals and supervisors.

It was pointed out by inference that the improvement of instruction must be preceded by a clear statement of what a teacher is expected to do. Until the teacher, principal, and all others concerned, have a clear understanding of the scope and nature of a teacher's duties, the measurement of quality of instruction is not likely to be accomplished with fairness and validity.

Immediate Action

The board promptly appointed a strong committee of teachers and principals to analyze teaching and draw up means of evaluating it. Another year of hard work went into this project. In the spring of 1959 this committee brought out an appraisal instrument aimed at the improvement of instruction. It was based on the assumption that improvement must come from self-evaluation supported by the thoughtful judgment of the building principal.

Quality of Instruction

NATT B. BURBANK

A professional and laymen's committee appointed by the Boulder, Colo., board of education recommends improved evaluation to precede merit rating of the work of teachers, principals and supervisors.

Approved by Teachers

This evaluation form was submitted to all of the teachers of the district for discussion and suggestion. Several improvements were made as a result of this process. Finally, an anonymous straw vote was taken to determine the degree of acceptance by the teaching staff. The results indicated that four out of five teachers felt that it was a satisfactory device.

It was soon approved by the board of education and adopted for use during the 1959–60 year.

The Instrument

The appraisal form is divided into six parts, covering personal qualities, professional qualities, teacher-staff relationships, teacher-community relationships, classroom control and management, and instructional and guidance skills. Under each of these headings there are from three to thirteen specific items. Rating is accomplished by checking one of several boxes provided to indicate the level of success in the particular activity. No numerical computations are involved. There is no general over-all rating at the end.

Periodic Appraisal

During the first year of a teacher's service in the Boulder schools, his work is evaluated twice. There is one rating in the second year and another in the third. After he earns permanent tenure at the beginning of the fourth year the evaluation takes place once every three years.

The building principal is given full responsibility for assessing the work of the teachers in his school. He may call upon others for assistance but in the last analysis he must make the decisions himself.

He knows that his judgments should be supported by many classroom visits, numerous observations of other phases of the work of teachers, and by some thorough thought about the total pattern of teaching.

The teacher is invited but not required to evaluate himself before his principal does. The building administrator gives the teacher a copy of his rating several days in advance of the required teacher-principal conference. This enables the teacher to analyze the evaluation carefully and be ready to comment on it in the conference. The entire process is pointed toward the improvement of teaching. Every effort is made to avoid the impression that rating is a punitive process for the record. The underlying principle is that the strengths and the weaknesses of instruction must be identified before improvement can be made.

Principals Also Evaluated

The success of the teacher-principal committee in its first assignment led the board of education to ask the same group to perform a similar task concerning the principalship. The outcome was another rating sheet called a "Guide for Principal Appraisal."

The general approach was similar to that used in the teacher appraisal. Here the evaluation is done by the superintendent and teachers. The superintendent must rate the principal at least once every two years. Every teacher is invited to evaluate the work of the principal once every three years. This is optional but any such rating must be signed.

A Good Beginning

Very few people in Boulder believe that the instruments now in use are totally satisfactory. It is generally thought, however, that a good start has been made on the fundamental job of finding out what makes a teacher or a principal successful. This is the first step in the general improvement of staff accomplishment. ■

Dr. Renner is associate executive secretary of the National Science Teachers Association. On January 1, 1962, he will assume the position of associate professor of education at the University of Oklahoma.

The Junior

Enrollment in 9th grade science courses reached more than one and one-half million in 1958. Changes are advocated for general science if it is to be retained in the junior high school

Let's abandon the present junior high school science curriculum and design a new one! This statement is quite representative of the feelings of some science teachers, supervisors, administrators, and many research scientists. Perhaps this is the correct thing to do. Before we do, however, let's take a close look at junior high school science. Let's be sure we don't "throw the baby out with the bath."

Within the sphere of education, the junior high school concept is quite new. It has come a long way since its initial appearance in 1910, but it is still inadequate. This inadequacy is due to such things as the lack of acceptance of a 6-3-3 plan by some parts of the country, inadequate research in the junior high area, and a lack of *career* junior high teachers. Whatever the inadequacies of the junior high school as a whole, they are amplified in its science program.

Lack of Laboratory Experience

In most geographical areas, junior high school science has, in the past, been disqualified as a science because it lacked individual participation in a laboratory. Teacher-conducted and/or student-team demonstrations and experiments were, in a vicarious way, to provide laboratory experience. Just as vicarious experiences will not teach one to play the flute, neither can the processes of science be learned in this manner. The products of science (its facts) were taught in a nonexperimental, noninductive manner.

The second "strike" on junior high school science is the concept that most educators and scientists have of "general science." In the past, the general science course has been a "collection" of material pulled from all areas of science and taught as miniature courses in astronomy, biology, chemistry, geology, meteorology, etc. The textbooks, in order to be attractive to all sections of the country, presented general science in just about that fashion. If such a course gained a bad reputation, it was richly deserved. So, some of the critics of general science say, "Let's throw the rascal out."

There is much speculation as to what should replace general science. The science courses most frequently proposed for junior high school are: earth science, physical science, and biology. The specific grade level for these courses varies from plan to plan and with the geographical area. Some areas, for example in Pennsylvania and Virginia, have done some experimenting with earth science in the junior high school. Other systems have experimented with biology as a ninth grade subject. All that can be said at this point is: there is no common grade-level assignment for these courses as yet. Lest the reader think that there is a wholesale movement toward these courses in our junior high schools, there is not. The greatest percentage of junior high schools are still teaching general science.

Should general science be retained in the junior high school? General science, or any course, should be introduced or retained only if it fulfills a definite need. Is there, then, a need for general science? Perhaps a few enrollment statistics will give a clue to the answer to that question.

Science Enrollment Figures

The U. S. Office of Education estimates that, in 1958, 1,581,000 students were enrolled in 9th grade science.[1] This figure represents 63.8 per cent of the student enrollment in grades 9–12. Biology enrolled 76.4 per cent, and the next highest enrollment was found in chemistry, which enrolled 37.8 per cent of the grades 9–12 student body.[2]

If general science were *not* offered, those students enrolled in biology

[1] "Offerings and Enrollments in Science and Mathematics in Public High Schools, 1958," U. S. Office of Education, U. S. Government Printing Office, Washington 25, D. C., Bulletin No. 5, 1961, p. 35.

[2] *Ibid.*

High School Science Picture

JOHN W. RENNER

and not taking physics and/or chemistry would not receive *any* education in the physical sciences. This is assuming that general science would not be replaced with something. As has been mentioned, a few school systems are experimenting with a special-course replacement for general science, and some are having great success. In so doing, however, the children in those schools are made to begin specializing in science at approximately age *twelve*. If these special courses are aimed at the general education of children, then this specialization is not objectionable. Then, of course, the specialized courses are becoming more the "general" type of course.

A very valid and obvious question at this point is whether or not specialization at the age of twelve is objectionable. The answer is: for some, "no" and for some, "yes." To this writer, however, there seems to be a need for an opportunity to teach science as science and not science as served up according to the separate disciplines. Each child should have the opportunity to study those "umbrella" or "overarching" principles such as energy, atomic structure, etc., that do not know the bounds of individual disciplines. Science began this way. Subject-matter lines have been sharply drawn within the past one hundred years. Then, such cross-disciplinary courses as biochemistry, geophysics, biophysics, etc., began to appear. On the extreme forefronts of scientific research, however, subject-matter lines tend to dissolve. For example, a recent Nobel laureate in physics is turning his attention to the biological sciences. If on the forefronts of scientific research subject-matter lines tend to disappear, should we as educators hasten to establish them at grade levels lower than those where they are now established? Perhaps the fundamental processes of science (its methods) could get a better root system if the "science" in general science were emphasized more strongly.

Suggested Changes in General Science

If general science is to be retained in the junior high school, should it be changed? *Most definitely*. First of all, a laboratory should be added to every ninth grade course that is taught! This laboratory should emphasize the "discovery" aspects of science. The objective of this laboratory should be *how* something is found out and not *what* is to be determined. The laboratory should probably ask more questions than it answers. The student should develop the idea that the laboratory is a place to try out new ideas, and not a place to slavishly follow a "recipe" to obtain a predetermined result. Students should never feel the urge to say, "The experiment didn't work." Rather, they should develop the attitude of, "What can these results contribute to the problem we are solving?" Such attitudes as these can *only* be developed in an actual laboratory situation. Should seventh and eighth grade science also have laboratories? Yes, but let us begin at the ninth grade level and then move on to the other two.

The second change that is necessary in general science is that nearly all of the technology presently "cluttering up" the course should be eliminated. Much materials from the senior high school on such things as chemical reaction, electrical circuits, plant growth, and electromagnetism should be moved into the junior high school. In other words, the substance of general science should be truly science and not "watered-down" technology.

Yes, general science should be kept in the junior high school because too many would miss too much if it were discontinued. General science, however, is "sick" and needs the "miracle drug" of re-evaluation to reclaim it. ■

Substitute teaching is a neglected area in American education. Less attention has been given to this phase of the instructional program than to many other areas of lesser importance. With the increase in sick-leave benefits and more released time for professional activities of teachers, there will be an increasing need for substitute work. Educators need to recognize substitute teaching as a highly specialized professional service; not a "baby-sitting" job.

Substitute teaching is already "big business." Approximately 200,000 persons served as substitute teachers in American schools during the 1960–1961 school year. Approximately 9,000,000 teacher days were taught by substitutes. The statistically "average pupil" was taught by someone other than his regular teacher or teachers six days during the year. There is approximately one substitute for every six or seven regular teachers.

In a recent survey conducted by the writers an overwhelming majority of substitute teachers, regular teachers, and principals expressed dissatisfaction with the quality of teaching done by substitutes. It is strongly to the credit of substitutes that they perceive these weaknesses and desire to increase their effectiveness.

Before any meaningful steps can be taken toward improving this situation, the education profession must change its concept of substitute teaching. The following items must be considered before any improvement can be expected:

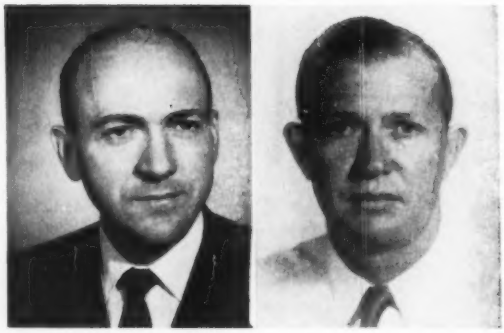
1. Recognize that substitute teaching is an important aspect of American education.

2. Recognize that substitute teaching in general is not of a high professional caliber.

3. Recognize that all persons and agencies involved in education must be committed to the job of professionalizing substitute teaching.

4. Recognize that state education agencies, teacher-training institutions, and local administrators must accept their unique responsibilities for initiating programs of improvement.

One of the first steps to be taken by administrators in improving an educational program is to examine present practices and locate the problems that confront the educational workers concerned with the program. It is helpful in examining a program



Dr. Bear (left) is an associate professor and Dr. Carpenter, an assistant professor, both in elementary education, Alton campus, Southern Illinois University, Alton, Ill. Dr. Bear is also a member of the board of education in the Alton District #11.

if the status quo can be compared with an evaluative instrument which lists the characteristics of an effective program. The writers present the following check list as one that includes many of the promising practices found in school systems throughout the country. This list might be considered as descriptive of an effective program. Many of the items might be considered as objectives in the improvement of local programs. School programs which rate a low total score on this instrument, might begin a program of improvement by giving attention to items which are rated as average or below. The writers believe that the items will reveal the strengths and weaknesses of substitute teaching programs.

Directions for Scoring

The form of this rating scale is similar to that used by Ragan[1] in his evaluative instruments. The blanks preceding each item should be used in scoring the practices in your school. Use a 0 if the practice is nonexistent or inferior; 1 if below average; 2 if average; 3 if above average; and 4 if excellent. Add the scores and divide by the number of items to get the total rating.

____1. A state teaching certificate is required of all substitutes.

____2. The board of education recognizes the importance of substitute teaching by defining the areas of responsibility.

____3. The board of education has adopted a set of rules and regulations governing substitute teachers and substitute teaching.

____4. The administrative staff considers substitute teaching as a highly specialized service.

____5. A co-ordinating committee made up of administrators, principals, teachers, and substitutes continually studies the substitute program.

____6. The salary schedule offers substitute teachers the same salary (on a per diem basis) that beginning teachers with comparable qualifications receive.

____7. There is a substitute-teacher salary schedule based upon training and experience.

____8. The substitutes rated excellent are guaranteed a specific number of days employment during the school year. (full-time, half-time, or quarter-time employment)

____9. One person on the administrative staff is assigned to the task of co-ordinating the substitute teaching service in the district.

____10. The co-ordinator receives all notices of teacher absence and assigns all substitutes.

____11. There is a continuous recruitment program in the community to interest qualified persons in entering substitute teaching.

____12. Orientation sessions are held for all new substitutes.

[1]William B. Ragan, *Modern Elementary Curriculum*. The Dryden Press, Inc., 1953.

Substitute Teaching Programs

DAVID E. BEAR and REGAN CARPENTER

A check list to show the strengths and weaknesses of substitute teaching programs prepared by two education faculty members of Southern Illinois University.

...13. An in-service workshop program is provided for all substitutes.

...14. A substitute-teacher handbook is provided which contains much information pertinent to the job.

...15. A personal folder is maintained on each substitute which is similar to that maintained on the regular teachers.

...16. Pay is provided for in-service growth through reports based on classroom visitation.

...17. The co-ordinator consults frequently with the building principals concerning the success of the various substitutes.

...18. The co-ordinator evaluates the total substitute program by using objective data.

...19. There is two-way communication of ideas between the co-ordinator and the substitutes, thus allowing the substitute to participate in program improvement.

...20. Each substitute is assigned to the schools where she can function best.

...21. The co-ordinator conducts individual conferences with substitutes who are in need of help.

...22. Selection and assignment of substitutes are made on the basis of merit.

...23. Substitutes are assigned only to grades and subjects for which they are qualified.

...24. The principal informs each substitute of the building rules, regulations, and time schedules of the school.

...25. Each principal has developed a mimeographed sheet of instructions and information to give the substitutes.

...26. The principal accompanies each substitute to the classroom and makes her acquainted with the duties to be performed.

...27. The principal shows the substitute where the regular teacher keeps her teachers' guides, desk copies of textbooks, instruction supplies, and other necessary materials of instruction.

...28. The principal informs the substitute of all duties for which she is to be responsible.

...29. The principal informs the substitute of the special physical defects of certain pupils.

...30. The principal informs the substitute of the children who are to perform special functions outside the classroom, such as, safety patrols, special music lessons, speech correction, and others.

...31. The principal informs the substitute of the special groupings of pupils.

...32. The principal visits the substitute frequently to offer assistance.

...33. Classroom teachers have the following available at all times in the event a substitute is needed: (*a*) Instruction plans for the week, (*b*) schedule of classes, (*c*) record of the grouping of pupils, (*d*) class roll book, (*e*) textbooks and teachers' manuals.

...34. Substitutes are invited to join the local education association and to participate in other professional activities.

...35. A regular classroom teacher is assigned to give help to the substitute; usually a teacher at the same grade level or in the same subject area.

...36. Substitutes are encouraged to subscribe to the NEA Code of Ethics and the Substitute Teachers' Code of Ethics.

...37. The substitute program avails itself of services of excellently qualified retired teachers.

...38. Substitutes are allowed to participate in the teachers' retirement system. (This is regulated by state laws.)

...39. The substitute is informed that she should notify the principal of any unusual request on the part of a pupil or parent, any unsatisfactory behavior of a pupil, or any other extraordinary circumstances.

...40. The principal or teacher expresses appreciation to the substitute at the end of an assignment.

This rating list has been completed only recently and has not been applied widely. The writers are acquainted with several school systems which could score an aggregate of at least 90 points on this scale, but few which could score much higher than 110 points. Frankly, large urban districts should not be satisfied with a total rating of less than 150 points on this scale, and outstanding schools should strive to score higher. However, many small districts and rural schools are not faring as well with their substitute teaching programs. Some school systems in America would total scarcely more than 60 points on this rating scale, and scores in the 80-point range would be common. Every one of these districts should seek to upgrade its substitute teaching to the 120-point range as an immediate goal, with a long-range goal of a 150-point rating. Wasting those days when regular teachers are absent is a luxury which America's schools cannot afford! ■

The School Plant

A special report, "Planning High Schools," is presented in the November SCHOOL PLANT section. Featured is Montclair High School, Montclair, Calif. After this school was built, the author wrote a construction guide on planning high schools, and an abstract of this guide is presented.

The construction of the air-conditioned Robert E. Lee High School, Midland, Tex., is covered in another article. The architect of this school received a design citation from the American Association of School Administrators.

Other subjects reviewed in this section are fallout shelters for schools, an addition to an existing school plant which won an AASA citation, a check list for the design and equipment of the classroom, part two of a check list on evaluating school furniture and equipment, and a group of Notable New Schools — all informative reading for school officials and board members.

The Robert E. Lee High School

DR. HAROLD H. HITT

Air-conditioned new high school in Midland, Texas, wins design citation from American Association of School Administrators. The school has a 2,200 student capacity, and construction cost $12.10 per square foot for 234,948 square feet.

Now in its final construction stages is the $2,844,000 Robert E. Lee High School, Midland, Tex. Total completion date is December 1, but the school opened for classes September 1. It has a 2200 student capacity and is set on a 40-acre gently sloping site.

The American Association of School Administrators has recognized the architectural firm of Preston M. Geren, Fort Worth, Texas, with a design citation for the plan of this new school. The citation reads: "This building reflects good educational planning. Exterior exposures have been reduced to a minimum to make air conditioning feasible. Interior vistas relieve shut-in feeling of inside classrooms. Strategically located are planning areas and central library. Good overall relationships tie the various units into an integrated whole."

The planning for the school was begun in the fall of 1958 when the architect was engaged and preliminary research started.

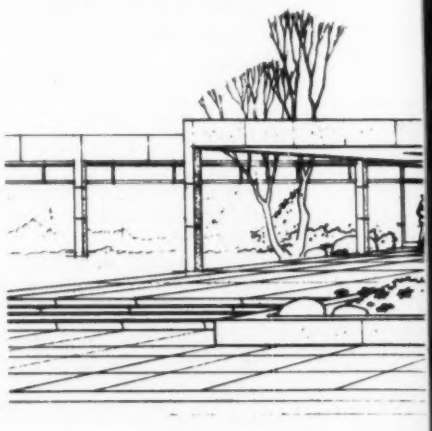
Weather conditions in the school district where the new high school is being built are such that air conditioning was considered advisable. The temperature often varies as much as 50 degrees in a school day, and sky glare and intense sand and dust storms are a continuing problem.

Light, Airy Atmosphere

The building is basically a complex of six buildings, generally under one roof. The school is described as having a "light, airy" atmosphere. Glass forms the top three feet of most interior and exterior walls, and the view extends to natural light of the interior planted areas or to the outside. Every corridor has a view to the outside, and each has a different color scheme, carried out in ceramic tile walls and lockers. In corridor intersections in the main academic and science-business buildings are eight sun-lit planted areas.

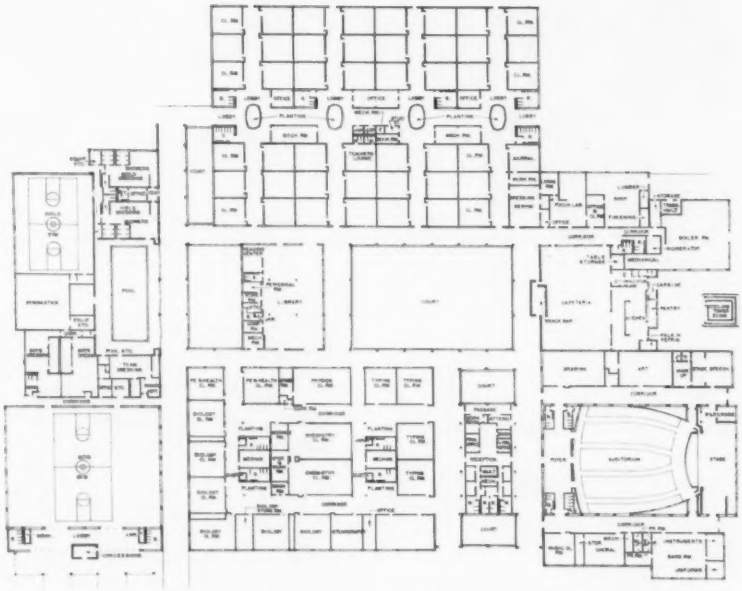
Five large, open landscaped courts are included within the complex. In the organization of the school day each student will be out in the open at least twice a day. Around the perimeter of these "social courts" are covered walks, 16 to 24 feet wide. Rugged landscaping will be featured in each court and outside the white-faced building. Trees, large boulders, grass, shrubs, brick paving, exposed aggregate concrete (concrete washed off permitting gravel to show) and colored glazed brick walls (accents) serve as landscaping elements. This important phase of giving the facility its distinctive character has not been left to chance; landscape planners have been used by the architect since an early stage in design of the school buildings.

Departmental offices, although planned as a space economy, are unusually large for several reasons. They will provide a home base, including storage space and desks for "floating" teachers. They will provide work areas for teachers during their conference periods, freeing class-



Construction

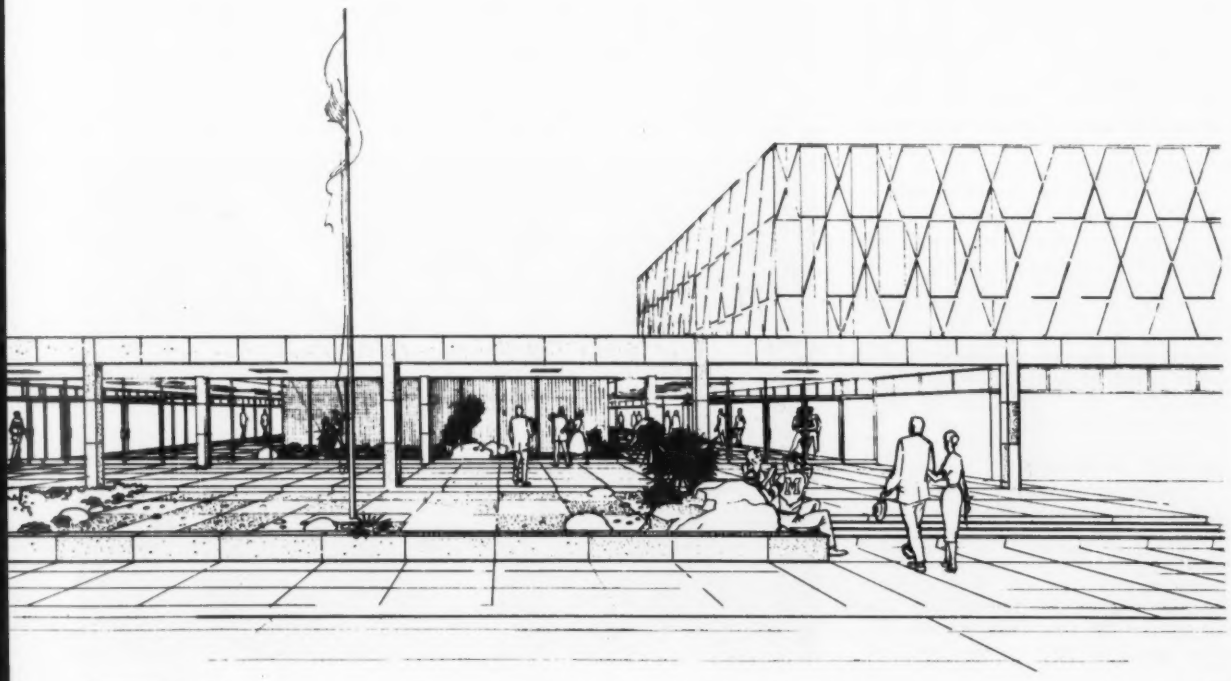
Foundation — reinforced concrete
Floor Structure — reinforced concrete
Frame — structural steel
Roof Structure — structural steel
Enclosing Walls — 12" masonry, face brick (some glazed trim brick, tile back-up) interior plaster except gyms, etc.
Exposed Structure — enclosed in Mo-Sai stone
Partitions — generally plaster and plate glass. Corridors ceramic tile. Pool, gym, dressing rooms structural glazed tile and brick.
Floors — asphalt tile, terrazzo, ceramic tile, and wood
Ceilings — acoustical plaster, Fiberglas, with mineral tile in music areas
Millwork — birch
Landscape — trees, grass, shrubs, brick paving, exposed aggregate paving, large boulders, and brick walls



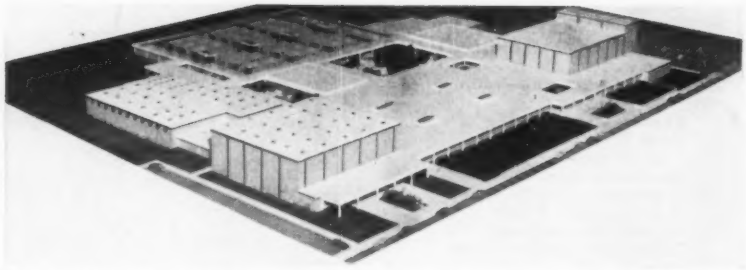
Floor plan of Robert E. Lee High School, Midland, Tex.

rooms for instruction. They will give departmental chairmen an opportunity to work closely with teachers, particularly the newer members of a department. They will provide for departmental storage of specialized equipment, making it readily available to all members of the department.

Below: Architect's drawing of front entrance to Robert E. Lee High School, Midland, Tex.



Dr. Harold H. Hitt is superintendent of Midland Public Schools.



Scale model of new high school. Beginning with nearest unit, buildings are, clockwise, physical education, main academic (without roof on to show interior section), cafeteria, auditorium-fine arts, offices, science-business.

Flexible Physics Room

Classrooms with particularly noteworthy innovations are the physics room and a business laboratory. In physics, none of the furniture is fixed. This permits a wide range of experiments. Utility connections will be suspended from the ceiling in 16 seven-foot pedestals.

Expensive electronic equipment needed for office practice and bookkeeping classes — electric typewriters and calculators for example — will be maintained in a central business laboratory. This extra large room will have a lecture section in the middle, equipment on the sides. Centralizing the equipment represents a saving and means that both types of classes will have available the equipment they need.

Off-street parking will be provided for 600 automobiles. The ratio is the same as that for a shopping center — rather unusual in a school facility.

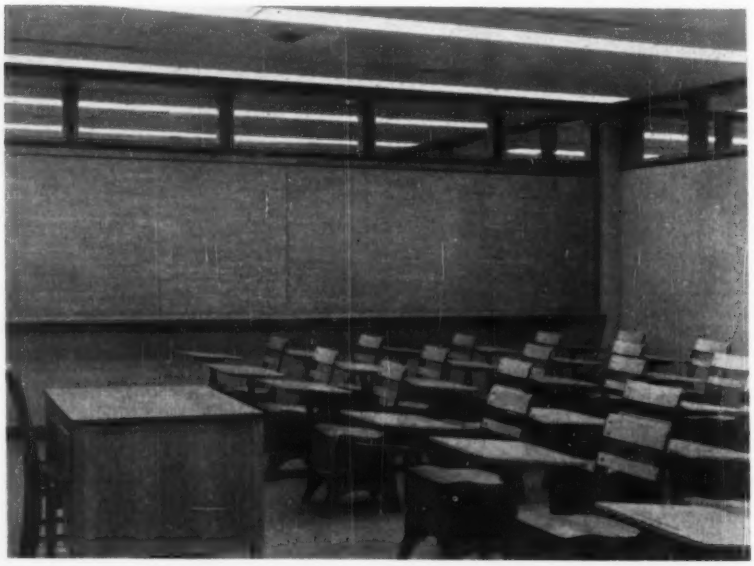
The school looks to the future, too. All interior walls may be removed, meaning that sizes and shapes of classrooms can be changed if desired. Access is possible in all ceilings in case closed-circuit television should be considered someday.

Is the new school a pretty and imaginative concoction whipped up by an architect?

Certainly much credit goes to Preston M. Geren, Jr., for the facility, but consider for a moment the joint planning that went into making the school one truly suited to Midland and its educational goals.

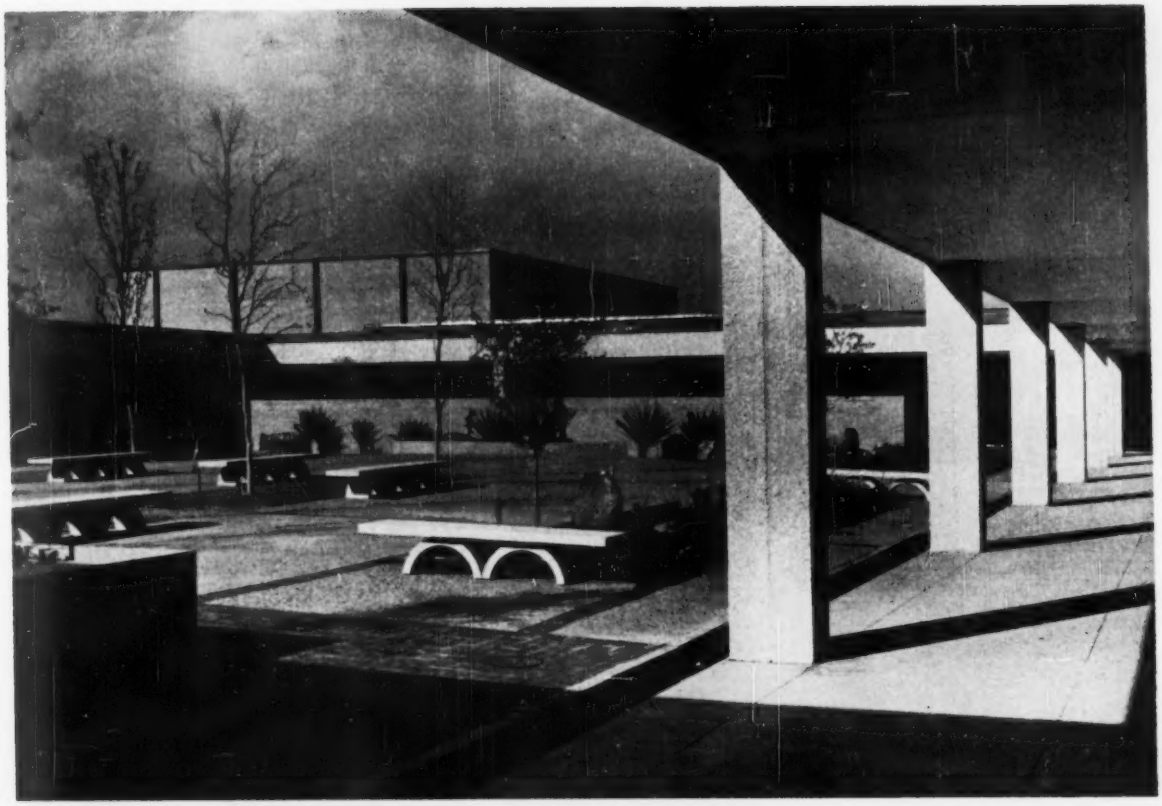
Architect Hired Early

The board wisely hired Mr. Geren almost three years before the anticipated opening date, an almost unheard of move. From the beginning, Geren worked closely with school officials in determining the needs for the new high school. His first seven months on the Midland

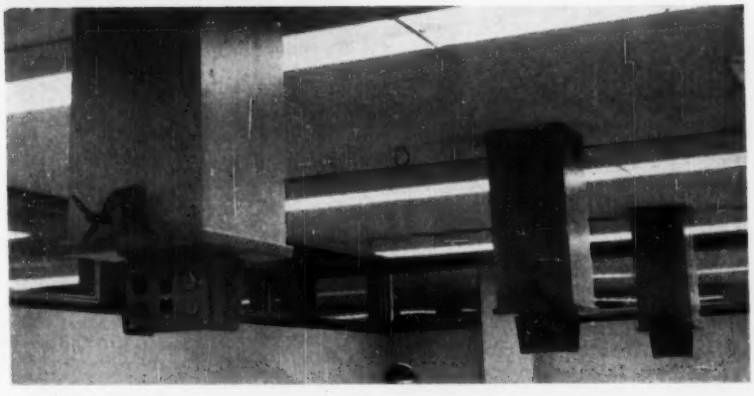


Above: interior of finished mathematics classroom has 3 ft. of glass at top of wall, which in most classrooms is on four sides for the purpose of avoiding the feeling of claustrophobia. Teachers helped design placement of three walls of chalkboard.

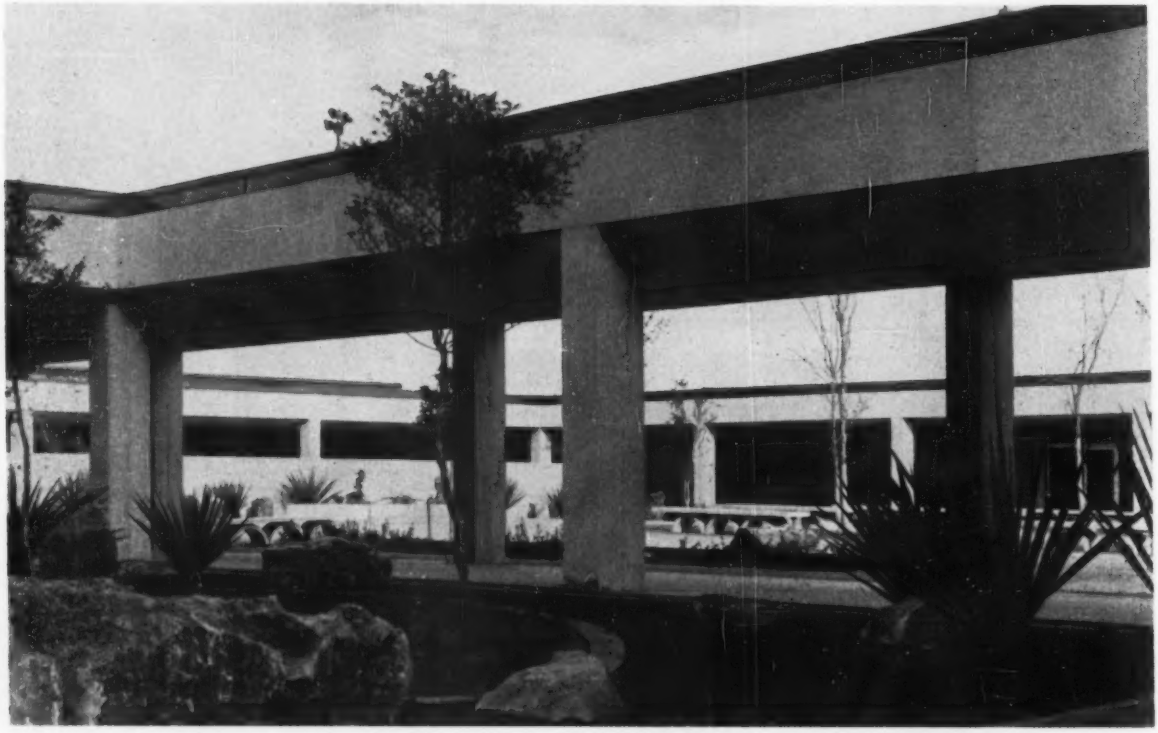
Below: corridor featuring planter and skylight. Lockers are of different colors in different corridors for color accents and to help students situate themselves.



Above: Courtyard just north of office suite. Landscaping is rugged. Note covered walk around the perimeter of central court to the right. Covered walks in the building range from 16 to 24 ft. wide. Left: Cafeteria is on east side of central court at Robert E. Lee High School. A glass wall permits students to see the landscaped court while they are eating.



Ceiling connection pedestals in the physics lab are a unique feature in the Science-Business Education Bldg. Electrical and gas connections are suspended from the ceiling on nine such pedestals as these which makes it possible to move lab furniture as needed for experiments.



Central landscaped court, Robert E. Lee High School. This is the largest of five open courts in the school.

assignment produced an architectural survey which influenced the facilities for the new high school. The survey showed that it was unnecessary, in terms of anticipated demand for certain courses, to duplicate certain expensive space or equipment already available at the old Midland High School.

Thus it was decided that only a limited number of vocational courses need be offered in the new school. The new school will have, for example, a general shop program and will not duplicate the Midland High School's expensive vocational programs in wood and metals. Electronics will be a science rather than a vocational course. Less space is devoted to home economics than at Midland High. Vocational agriculture will be limited to the old school.

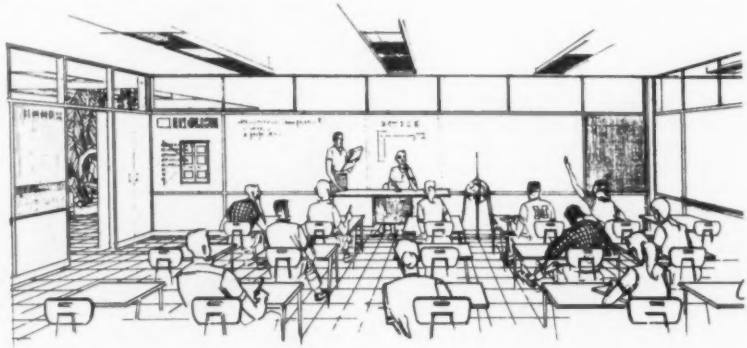
Interior planning — placement and amount of chalkboards, storage space, special cabinets and the like — involved weeks of work between Mr. Geren's people and departmental committees at Midland High School. This is a step for which many systems have not taken needed time when planning a building. The physics room idea grew out of one such meeting. The architect was "gratified to find that the amount of cabinet work was reduced by the teachers rather than increased."

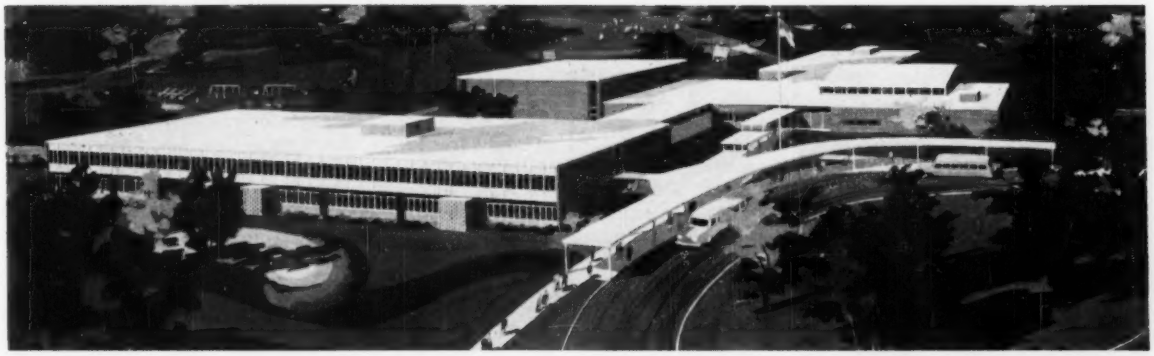
Trustees Visit New High Schools

Not long after the architectural survey was presented to the board, the trustees began visiting new high schools in the Midland area to give themselves a better understanding of current building practices. With Mr. Geren and Superintendent Harold H. Hitt as their guides, they looked at types of structure and design, sizes and utilization of campus and, finally, materials.

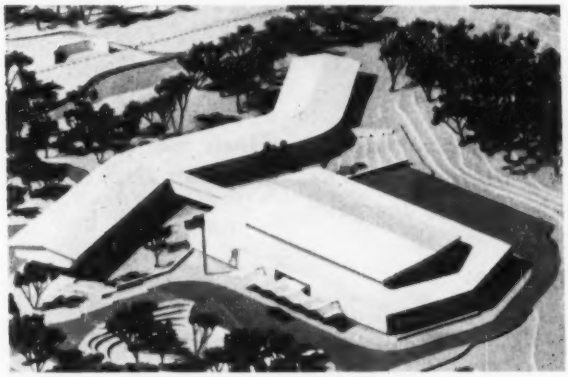
As a result of their observations, the trustees instructed Architect Geren to develop two plans for their consideration — a conventional, naturally ventilated building and a completely year-round air-conditioned building. Those became plans "A" and "B" respectively. Eventually, a board majority rejected both those plans and asked that their best features (the pleasant, outdoor atmosphere in "A" and the economical air conditioning in "B") be incorporated into a plan "C." It is this plan which a majority approved, and it enabled the building of Robert E. Lee High School at a construction cost of $12.10 per square foot. ■

Architect's drawing of classroom interior. Note three feet of glass at top of each wall and view to planter and skylight.





Scheduled for use in September, 1962, Little Plains Elementary School in the Harborfields district of Greenlawn, L.I., N. Y., will provide 24 classrooms, including three kindergarten rooms; a multi-purpose room serving as auditorium and cafeteria; a double station gymnasium with locker rooms; library; music room; health room; teachers' room and office area. To take advantage of the rolling site a portion of the 750-pupil school will be two stories. Ketchum & Sharp, New York City, are architects for the $1,275,000 building, so designed that eight more classrooms can be added.

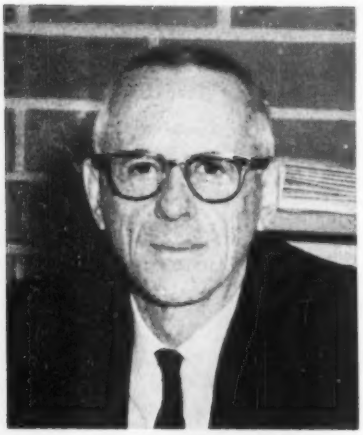


Model of new Chichester Senior High School, to be built on a 45-acre site in Upper Chichester Township, near Boothwyn, Pa. Designed by Architect Vincent G. Kling FAIA of Philadelphia, the 789-student school is made up of two units: a large one-story commons building, and a long, two-story classroom wing which curves with the natural contours of the site and overlooks a small stream. The new school is scheduled to be completed in the fall of 1962. Edgar E. Richards is superintendent of the Chichester schools.

Notable New Schoolhouses

school building
scrapbook

The Fernando Rivera School, Daly City, Calif., is an elementary school which earned one of the top honor awards of the American Institute of Architects. Richard L. Foster is superintendent of the Jefferson Elementary School District in which the school is located. The school is the ninth constructed by Architect Mario J. Ciampi for the Jefferson Elementary School District over a ten-year period. Total cost with architectural fee, $456,000, including furniture ($29,000) but not site ($55,000). The roof is not just one single sweeping plane, but instead is a pattern of folded plywood plates. The school has twelve classrooms, plus kindergarten, library, administration, and multi-use room.



C. C. Lovewell is principal of the new Montclair High School, Montclair, Calif.

Planning High Schools

C. C. LOVEWELL

A construction guide on planning high schools was written by the author after construction of the new Montclair High School. This article is an abstract of the guide.

Introduction

In the fall of 1956 C. C. Lovewell was appointed principal of a four year high school which did not exist except as an expressed need in the master plan of a growing union high school district. Bonds had been voted, an architect approved, and the date set for the school's opening, three years later. As principal-elect it was his responsibility to work with the architect, the administration, and the board in planning, equipping and even staffing the proposed new school.

The search for guide lines in this task was not rewarding. Many school districts were so occupied building schools that little time remained to reflect and compile a record of what actually happened in the process.

After the school was opened in 1959 C. C. Lovewell prepared a construction guide, based on this experience, for planning the next (fourth) high school which goes to bid next winter. The procedures reported in this article have been abstracted from this Guide.

Better high school plants result when two important factors are provided: One is a quality job of planning the educational specifications; the other is the service of an architect capable and willing to create a structure which gives substance to the specifications.

Educational Specifications

The following outline indicates the areas which were included in the education specifications:

1. A statement of the school's philosophy
2. A listing of broad objectives
3. The proposed administrative organization and areas of responsibility
4. The program of studies
5. Methods and organization for servicing instructional materials. i.e.
   - *a*) Library
   - *b*) Textbooks
   - *c*) Audio-visual equipment
   - *d*) Production and storage
6. Pupil personnel services and how organized
7. Provision for student body activities
8. Work assignments for custodial and clerical personnel
9. Space needs and their functions
   - *a*) Classrooms
   - *b*) Shops
   - *c*) Laboratories
   - *d*) Cafeteria
   - *e*) Storage
   - *f*) Offices
   - *g*) Instructional materials center
   - *h*) Assembly areas
   - *i*) Workrooms
   - *j*) Rest areas
10. On-site facilities and plans for their use
    - *a*) Parking
    - *b*) Delivery roads
    - *c*) Physical education areas
    - *d*) Athletic areas
    - *e*) Equipment storage
    - *f*) Landscaping

Planning the educational specifications required several months and involved work with representatives of administration, teaching, the board, and consultants from the state as well as universities.

Some administrators have arranged with colleges of education to conduct workshops designed to develop vari-

ous phases of the educational specifications. This procedure encourages thoughtful planning and serves to orient the participants to the newer facilities which the new school will contain.

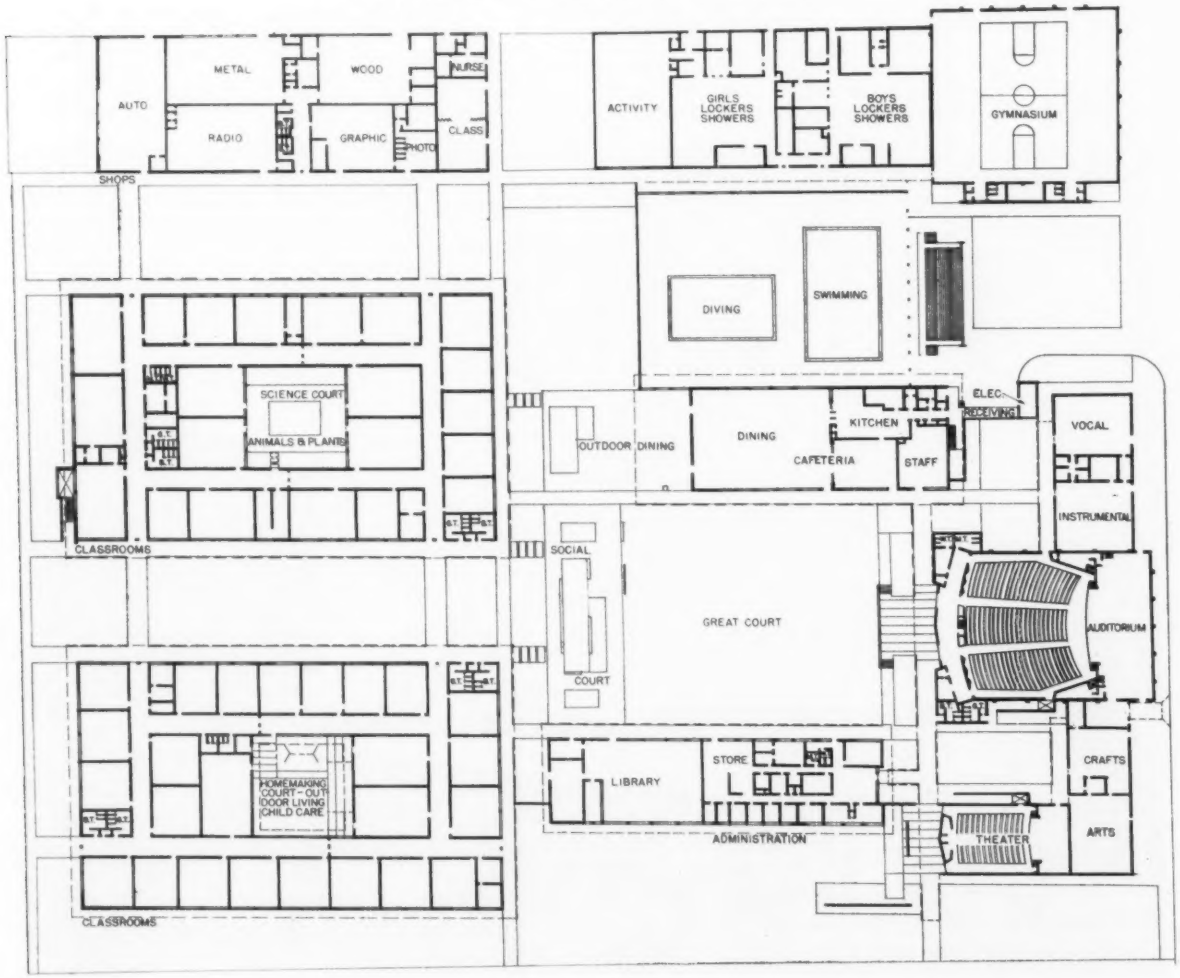
As detailed plans emerged they were carefully checked for possible structural problems. Details of the structure may be correct in every respect but out-of-order as they relate to instructional processes. For example, three electrical outlets may be specified for each classroom, but unless the circuits are carefully planned, two adjacent rooms will be unable to use projectors at the same time. The maximum load and location of electrical motors in the school shops is an obvious example of how instruction determines detail.

Rooms for teaching mathematics will require more chalkboard than rooms for social studies which have greater need for tackboard. Unless this is indicated all rooms will receive the same treatment.

It is believed that most secondary school classrooms have too much glassed area. Glass is more expensive than brick walls to build and to maintain. Frequently it becomes necessary to erect expensive sun shields to reduce the glare from window surfaces. In order to use visual aids in the rooms, expensive blackout curtains are required. It was planned to have classroom windows consisting of 30 in. wide window strips at the ceiling level and glazed with low-transmission glass. The roof overhang protects the windows from direct sun. This has proven popular with teachers because of the additional wall space; the reduction of outside distractions and convenience in using audio-visual equipment.

Equipment specifications and the preparation of bid lists were tailored to the educational functions they were to serve. In classrooms, chair-desks may last ten months or ten years. Obviously a nine dollar desk may be a poor investment whereas an eighteen dollar desk may be the least expensive over a long period of time. Investigation caused the planners to specify a chair desk with textolite surface, nylon glides, and with all metal parts chrome plated. It was bid at $15.85. After two years of use the desks look like new furniture. Equipment for shops, laboratories, physical education, business and offices offered a wide range of prices for similar quality. The specifications

Floor plan of Montclair High School, Montclair, Calif.



were carefully prepared and the planners feel they received the most for their equipment dollar.

The chemistry course was designed for semi-micro. The total cost of both equipment and supplies was considerably lower than mirco and, incidentally is less hazardous to use. The physics course uses the P.S.S.C. program and much of the equipment has been built in the school shops by the students. These examples should indicate the importance of planning equipment specifications with reference to the curriculum.

Instructional supplies, unless standardized by the district, must be specified and budgeted. In California, supplies may not be purchased out of money voted for buildings. The budget for supplies (including textbooks) has run higher the first two years.

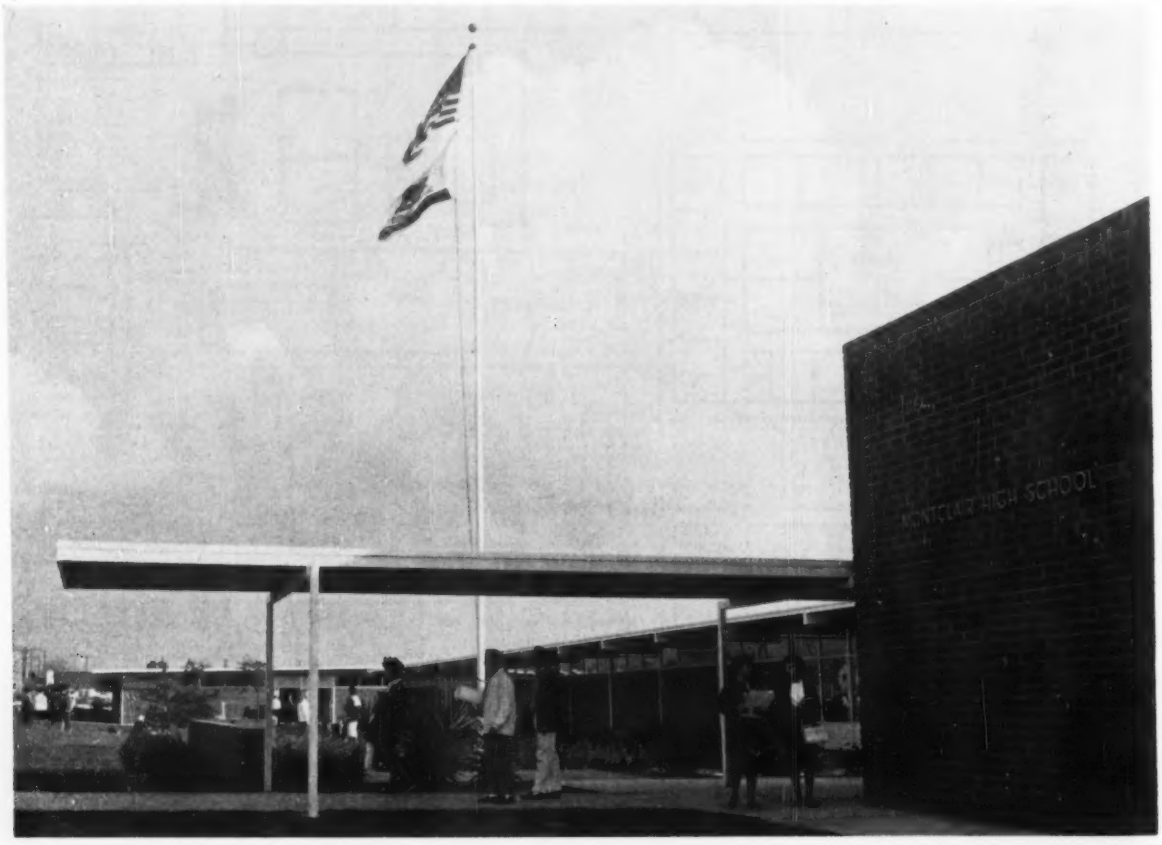
Nothing is more discouraging to staff and students than a beautiful, but bookless library. This happens too frequently in new schools. Selection of basic library books, supplies and writing orders for these is a job that required many hours. More than two months was taken for the delivery of the books after the purchase order was issued. The processing of one book required on the average 90 minutes. For a collection of 1000 books this represented 1500 hours of labor. For an initial enrollment of 500 students the ALA recommends a book collection of at least 6000 volumes. In money this will be approximately $24,000. One librarian working for a year will be able, at best, to establish only the basic reference materials. With one certificated librarian and three assistants they have been hard pressed to process $30,000 worth of books in two years.

Projecting Number of Teaching Stations Needed

The number of teaching stations needed were indicated by the program outlined in the educational specifications. Grade and subject enrollments were projected by using a four year average of the parent school. Allowance was to be made for program changes in the new school.

Our study indicated that 47.7 per cent of the total pupil-periods would

The three million dollar Montclair High School, Montclair, Calif., has 165,000 square feet and accommodates 1500 pupils.



be spent in academic classrooms. Applying this to a 1500 pupil school, with 9000 pupil-periods,[1] there are 4293 pupils-periods to be spent in academic classrooms. Assuming the average class size is 25, then 4293 divided by 25 is 172 academic classes. If each classroom will be scheduled for six classes, then 172 divided by 6 indicates that 28.6 academic classrooms will be needed in a new school of 1500 pupils. Following this same procedure, the planners determined enrollments in each subject area and summarized this information on "Space Adequacy" forms.

The "Space Adequacy" forms are a series of summary information sheets. Form A, reports pupil-period enrollment by departments. It lists the teacher, subject, enrollment by periods, total enrollment per teacher, the number of classes and the average class size. This form is very useful when the time comes to determine actual teacher needs and subject assignments.

Form B is a summary of pupil-period enrollments by departments. It serves to project space needs by areas of specialization. Form C, predicts teaching stations from pupil-period enrollments by summarizing the number of groups in each subject area.

For the architect's use a teaching station summary was made indicating the subject area, number of stations, suggested room size, the square footage, and the projected enrollment.

Space Allocation

The determination of square footage for general classrooms posed some difficult questions. If class groups were to vary in enrollment, would there be variations in room sizes? Some areas were to use double periods, or block-off-time schedules. Team teaching suggested variations in room relationships and sizes. Types and size of furniture would be a factor. Trends in educational programming posed many questions relating to space relationships. Recent construction in secondary schools had provided general classrooms of 800 square feet or more. This was the size adopted for most academic rooms.

The program and desired class size determined the space needs for special areas such as fine arts, homemaking, industrial arts, etc.

Careful planning needs to be devoted to the use of multi-purpose areas. The traditional auditorium is a questionable investment in many communities. However, with creative thinking the auditorium can be built to serve day-by-day space needs. A compromise was worked out to build an assembly area seating 750 and a smaller assembly area for 200. In the fourth school to be erected the planners are providing three spaces to accommodate up to 200 pupils each.

For each typical space provided, the following check sheet was used to plan the specific needs of the area:

Area

1. Activities that will occur in this area
2. Relationship to other facilities
3. Use, if any, by community groups
4. How supplies will reach the area
5. Furniture and equipment needs
6. Kinds of work surfaces needed
7. Storage areas to be provided
8. List of supplies for the area
9. Utilities to be provided
   - *a*) Electrical
     - No. of Outlets
     - Voltages
   - *b*) Compressed air
   - *c*) Gas
   - *d*) Water
10. Wall space needed for chalkboards, tackboards, pegboards, or bulletin boards
11. Provisions for using audio-visual aids
12. Intercommunication needs

Numberous meetings were held with the architect for the purpose of discussing the educational specifications, and the space needs and relationships. Following these meetings the architect began his preliminary site sketches. The school board was given frequent reports and opportunities to discuss each phase of the planning as it developed.

Equipping the New School

The three million dollar budget for the building was to provide 165,000 square feet and accommodate 1500 pupils. Approximately 10 per cent of the budget was required for equipment.

In planning equipment the planners began with the space summary. Under each area they accounted for all activities that would indicate the need for specific items of equipment. From this, an area summary sheet was prepared. Following is an illustration:

Area
Business Education
Typing — (3 rooms)

No.	*Equipment*	*Estimated Unit Cost*	*Low Bidder*
3	Desk, teacher 30 by 50 in., single pedestal	$ 80.00	
3	Chair, teacher	9.00	
102	Table, typing	15.00	
102	Chair, typing	9.00	
3	Demonstration typing stand	52.00	
3	Stop watch	12.00	
85	Manual typewriter	180.00	
20	Electric typewriter	295.00	
3	Adjustable stool	8.00	
6	File, four-drawer, letter size, w/o lock	52.00	

Area lists were very helpful to the person responsible for receiving and distributing the equipment. Adding the name of the bidder supplying each item of equipment paid dividends by making identification easier.

Consolidating similar equipment items into bid lists followed. Before bid lists were completed several companies were invited to submit samples and specifications for committee study. The planners also visited schools where the equipment had been in use for some time.

Timing is important in bidding equipment. Fall is a buyer's market. Union contracts are usually settled in the spring, so the manufacturer does not have to include a contingency factor in his bids because he knows his wage obligations. The bulk of equipment buying is in the spring while late fall is a slack time.

Equipment for science, art, homemaking, gym, cafeteria, and other special areas should be contracted for delivery at least seven months prior to expected delivery date; all other equipment at least six months prior.

If the school omits from the construction contract such items as lockers, bleachers, auditorium seating, laboratory tables, homemaking cabinets, storage shelving, etc., considerable savings will occur to the school district. ■

The following references proved very helpful in the planning:

Business Education

Layouts and Facilities for Business Education, Monograph 81, South-Western Publishing Company (1953) (Prepared by the California State Dept. of Ed.)

Fine Arts

Hanson, Abel, "Facilities for Art Experience In General Education," *California Journal of Secondary Education,* 23:279 (May, 1948)

Industrial Arts

Guide for Planning and Equipping Industrial Arts Shops in California Schools, California State Department of Education (1956)

Science

Hurd, Paul Deh., *Science Facilities for the Modern High School,* Monograph No. 2, School of Education, Stanford University (1954)

Physical Education

Dexter, Geneve, *Teachers Guide to Physical Education for Girls in High School,* Calif. State Dept. of Education (1957)

Library

Guidelines for Library Planners, Keith Doms and Howard Rovelstad, editors, American Library Association. Chicago (1960)

[1] A six period day with no study halls.

Planning a School Fallout Shelter

The architectural firm of Caudill, Rowlett and Scott, Houston, Tex., has made a detailed investigation of making a good schoolhouse serve as a fallout shelter. Co-operating were the nuclear scientists of Convair, Fort Worth, a division of General Dynamic Corporation. The school used in the report is W. E. Boswell Senior High School, Saginaw, Tex., near Fort Worth. Superintendent of Saginaw Independent School District is George Stott.

The study points out: "The immense hazard of radioactive fallout in the event of a nuclear war and consequent need for shelters has been widely publicized since 1955. To date the result is only a minute amount of actual shelter construction. Absence of protection is even more evident in the nation's schools, although no other building unit of local government is so well dispersed among the people."

The report assumed the major target would be Carswell Air Force base and aircraft complex eight miles south of the school and just west of Fort Worth. The second assumption was a one megaton weapon (equivalent to 1,000,000 tons of TNT) would be used on this target.

Effects of blast and intensities of fallout were estimated on the basis of the two assumptions. The school in question, a circular one-story light-steel-frame structure with aluminum window and brick cavity exterior walls and concrete slab foundation on grade, would receive only moderate damage. However, secondary blast effects such as flying glass and other debris might injure persons inside the school. Those unprotected outside would possibly suffer third degree flash burns from thermal radiation.

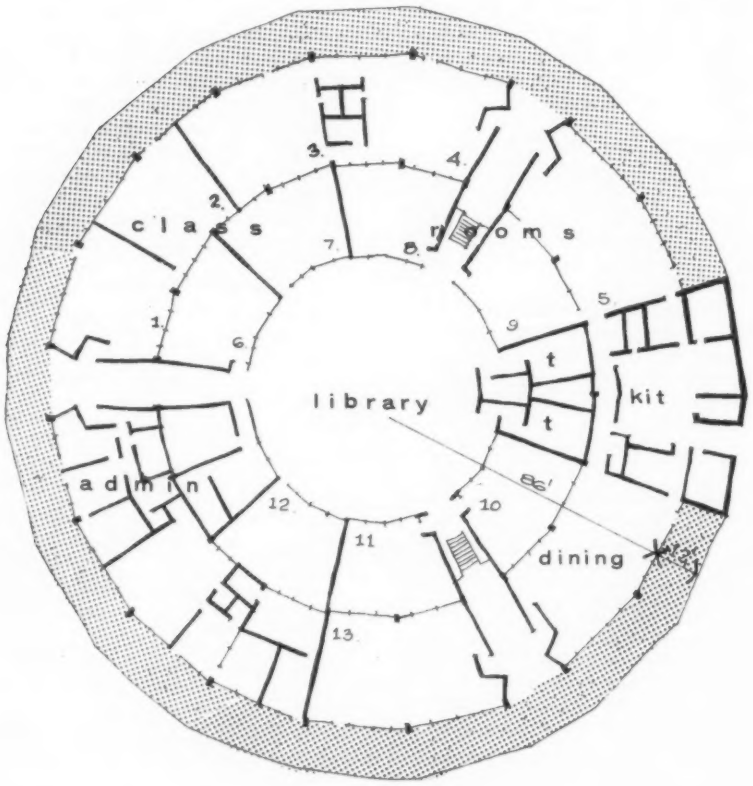
Next the report estimates the extent of radioactive fallout from detonation of this weapon. Radiation is measured in roentgens (a unit of radiation dose; i.e., two roentgens are received during a normal chest Xray). Boswell school area would receive approximately 7000 roentgens in two weeks after the blast, and killing doses would very likely extend more than 150 miles.

Design of the Shelter

Although generally speaking any shelter may be said to increase probability of survival, those built with attenuation factors of less than several hundred would produce a very dangerous sense of false security. A one-story house without a basement has an attenuation factor of about two. The report states: "Within a 50 mile radius of a one megaton burst, it appears a gamma ray attenuation factor of 1000 (amount of shielding necessary to reduce inside dose to $\frac{1}{1000}$ of outside dose) is needed to provide reasonable chance of survival."

The first few hours in the shelter are the most important ones because radioactive fallout intensity decreases rapidly with time. After two weeks, occupants may go outside a few minutes each day. Varying degrees of confinement will probably be required for several months to a year, unless effective clean-up measures are taken or survivors are evacuated.

For the Boswell school, it was decided the best shelter location was below the library floor. This space has a gross area of 10,500 sq. ft., and can shelter 700 people. Shielding material for the proposed shelter was ordinary concrete which is effective in varying thicknesses depending on the distance from the target. To insure shelter safety, the thickness of shielding at the entrance must be at least as thick as the solid wall. In addition, entrances should have the equivalent of two 90 degree turns to reduce scattered radiation.



Floor plan of Boswell High School showing the central library and classrooms. Plan for the school fallout shelter is shown on the opposite page

Minimum ventilation quantity that should be considered is 3CFM of outside air per person. This amount of air will permit only very light to moderate activity by shelter occupants. Air conditioning and increased ventilation of the shelter would allow some nearly normal physical activities. An approximate guide to quantity of air conditioning for shelters is one ton of refrigeration per 20 occupants.

In general, decontamination measures are not suitable for initial protection from fallout. Consequently, mass shielding is the best answer.

To determine the need for shelters in less densely populated areas or those where fewer probable targets occur, it seems possible to apply a probability approach developed by the government. Once the need is established, then the degree of shielding is calculated. A five year study was made for each weather station showing the percentages of probability of needing fallout protection. In the Boswell area, these range from less than 30 per cent to more than 90 per cent probability.

Cost of Fallout Protection

The cost of shelters varies with the distance from a probable target, whether or not the shelter is built as part of the school, and whether minimum or good quality is wanted. The good quality shelter includes: (1) air conditioning, (2) resilient tile flooring, (3) acoustical tile ceiling, (4) high level of electrical illumination, (5) conventional group toilet facilities and fixtures. The added cost to build a good dual-purpose shelter as part of the Boswell school was estimated as follows for the varying distances from the blast: Condition 1 (8 miles), $82,550; Condition 2 (30 miles), $78,050; Condition 3 (100 miles), $67,550; Condition 4 (190 miles), $27,050.

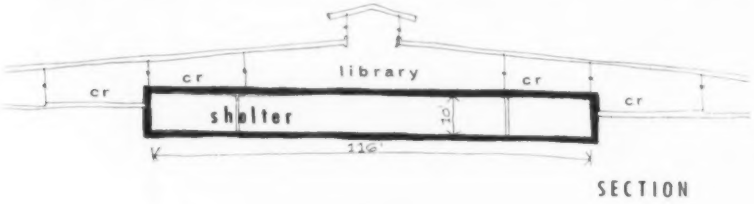
The report ends with four conclusions:

1. If the present Boswell school had been designed to include a dual-purpose shelter with good fallout protection, additional cost would be approximately 10 per cent more than the original cost.

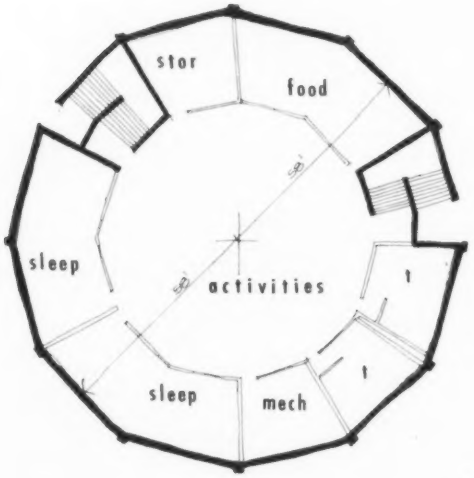
2. Fewer dollars will be spent ($22 to $63 less, in the study) for shelters if they are constructed in conjunction with other facilities such as schools.

3. Cost economies can be made by designing shielding of shelters to fit assumed conditions of distance from the target and size of weapon, but within 100 miles of the target savings are so slight they do not warrant decreased protection.

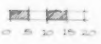
4. It is entirely feasible, both economically and functionally, to provide fallout protection to a school building without sacrificing conventional design features of teaching space: i.e., classrooms. ■



SECTION



PLAN



Blast damage from a 1 megaton surface burst is shown for varying distances from the blast. First, virtually complete destruction; second, partial destruction; third, moderate damage; fourth, light damage.

Evaluation of School Equipment and Furniture

ROBERT M. COMFORT

Part one of this check list article appeared in the October issue of the American School Board Journal. *The author is vice president of Roberts & Meck, Inc., Harrisburg, Pa., a firm specializing in supplies and equipment for schools and colleges and sanitary and maintenance supplies.*

III. Art-Craft Department

A. *Art-craft department furniture*

1. Types of furniture
   - *a*) Flat-top tables with various size tops
   - *b*) Adjustable angle top tables
   - *c*) Easels
   - *d*) Art horses
   - *e*) Ceramic equipment
2. Considerations
   - *a*) What activities are being taught? (Is equipment suitable to perform these activities?)
   - *b*) Are various activities being taught at the same time?
   - *c*) What working surfaces are used for various activities? Are they durable and easy to clean?
   - *d*) How are adjustable angle tops secured?
   - *e*) Is there adequate storage space? (Open and inspect.)
   - *f*) Check kiln:
     1) Is it correct size?
     2) What accessories are desirable?

IV. Homemaking Department and Faculty Room

A. *Homemaking department furniture*

1. Types of furniture
   - *a*) Food room
     1) Tables (expanding tops) and chairs
     2) Stools for counter
   - *b*) Sewing area
     1) Sewing tables and chairs
     2) Cutting tables
   - *c*) Home-living area
     1) Davenport (one-piece or sectional)
     2) Upholstered chairs
     3) Side chairs
     4) Occasional tables
        - (*a*) Corner
        - (*b*) Coffee
        - (*c*) End
        - (*d*) Nesting
     5) Dining room table (expanding) and chairs
     6) Buffet with hutch cupboard
     7) Teacher's desk and chair
2. Considerations
   - *a*) What activities are taught?
   - *b*) Are several activities being taught at the same time?
   - *c*) Is there adequate space, furniture, and equipment for each activity?
   - *d*) Is some furniture and equipment capable of multiple use?
   - *e*) Is the storage space adequate? (Open and inspect.)

B. *Faculty room furniture*

1. Types of furniture
   - *a*) See Living Area, Homemaking Department, VII
   - *b*) Work table for coffee and/or correcting papers
2. Considerations
   - *a*) Is space being efficiently used?
   - *b*) Is the faculty satisfied with the arrangement?
   - *c*) In what condition is the furniture? (Especially watch to see if wear is apparent on any furniture.)
   - *d*) Are there separate facilities for men and women?

V. Library

A. *Library furniture*

1. Types of furniture
   - *a*) Charging desk (how many sections? Straight L, or U-shaped?) with swivel chair
   - *b*) Student tables and chairs
   - *c*) Card catalog cabinet
   - *d*) Atlas stand
   - *e*) Dictionary stand
   - *f*) Legal file cabinet
   - *g*) Step stools
   - *h*) Book truck (standard and/or "depressable")
   - *i*) Lounge furniture including:
     1) Upholstered chairs
     2) Sofa
     3) Magazine tables
     4) Globe
   - *j*) Shelving — 8 in., 10 in., and 12 in. deep of various heights, plus newspaper and magazine sections, with or without backs, wood or metal
   - *k*) Book display units
2. Considerations
   - *a*) Is the librarian satisfied with the layout for
     1) Discipline?
     2) Traffic flow?
     3) Adequacy of study room?
     4) Storage facilities?
     5) Size of charging desk?
     6) Flexibility of such furniture as charging desk, card catalog cabinet, etc., for future expansion?
     7) Is there proper placement of equipment for maximum efficiency and control?
   - *b*) Is equipment
     1) Attractive?
     2) Comfortable?
     3) Sturdy?

VI. Health Suite

A. *Health suite equipment*
1. Types of equipment
   a) Examination table and/or chair
   b) Medical supply storage cabinet
   c) Sterilizer and instrument cabinet
   d) Lift top waste receptacle
   e) Adjustable stool
   f) Professional floor lamp
   g) Eye-test chart
   h) Scales
   i) Audiometer with table and chairs
   j) Sick cots
   k) Bedside tables
   l) Three-panel screens
   m) Waiting room chairs
   n) Desks, chairs, and files for staff
   o) First-aid cabinet
2. Considerations
   a) See if space and/or equipment is available but not being used
   b) What facilities are provided for sick children?
      1) Fold-away cots
      2) Tubular frame beds
      3) Hospital type beds with elevating springs
   c) Would nurse like to have additional equipment? If so, what and why?

VII. Cafeteria

A. *Cafeteria equipment*
(This area may also serve as multi-purpose room)
1. Types of equipment (mobile units may be "in. or against wall," or portable for storage elsewhere)
   a) Mobile bench and table units
   b) Mobile tables with chairs (folding or straight)
   c) Mobile convertible table, bench units
   d) Folding tables with chairs (folding or straight) or benches
   e) Non-folding tables with chairs (folding or straight) or benches
   f) Stage (permanent or folding)
   g) Book-tablet storage facilities for diners
   h) Seating facilities for multiple use
2. Considerations
   a) Is there disciplined flow of traffic?
   b) Is it easy to clean both tables and floor?
   c) Is there congestion with student movement "in" and "out" of tables?
   d) Is there multiple function of area?
      1) What other functions?
      2) Do the units readily adapt themselves to multiple use?
   e) Ease of operation; i.e., can the units be quickly and easily folded and stored? (Try and see.)
   f) Is there adequate provision for book storage facilities?

VIII. Music Department, Student Activity Room and Conference Room

A. *Music department equipment*
(may also serve as audio-TV room)
1. Types of equipment
   a) Chairs, with and without folding tablet arm
   b) Teacher's desk and chairs
   c) Storage facilities
   d) Music stands (conductor's and students')
   e) Risers (fixed or portable)
2. Considerations
   a) Is furniture and equipment capable of multiple use?
   b) Is furniture satisfactory for proper posture of musicians?
   c) Is there adequate storage space for equipment and music (open and inspect)

B. *Student activity room furniture*
1. Types of furniture
   a) Tables, fixed or mobile, of various sizes
   b) Student seating facilities
   c) Storage and equipment for miscellaneous activities
2. Considerations
   a) What variety of activities occurs in this room?
   b) Are different sizes and types of tables used for flexibility?
   c) What is the frequency of use of this room?
   d) Are the teachers and students satisfied with the units furnished?

C. *Conference room*
(see comments for student activity room, above)

IX. Administrative Suite

A. *Office suite furniture*
1. Types of furniture
   a) Desks, executive, clerical, and secretarial
   b) Credenza
   c) Swivel chairs
   d) Guest chairs
   e) Bookcase or shelf storage
   f) File cabinets
   g) Counters
   h) Work tables
   i) Equipment stands and/or cabinets (Portable or fixed)
2. Considerations
   a) Is wood or metal furniture used?
   b) Is there adequate and efficient work space
      1) On desk top
      2) Elsewhere for doing "come-back to" jobs?
   c) Are there adequate and efficient conference facilities using:
      1) Desk with overhang top
      2) Separate table
   d) Is there adequate storage and filing space?
   e) Is the proper chair furnished for each person?
   f) What is type of material on working surface?
   g) Does the layout and the equipment provide general efficiency in the offices?
   h) Is the style and color scheme attractive?

X. Auditorium

A. *Auditorium furniture*
1. Types of furniture
   a) Student seating
      1) Movable chairs, stacking or folding
      2) Fixed auditorium seating with:
         (a) Plywood seat and back
         (b) Upholstered seat and plywood back
         (c) Upholstered seat and back
         (d) Automatic seat risers
         (e) Auxiliary writing surface
   b) Stage furniture
      1) Tables, folding or non-folding
      2) Seating with chairs (folding, stacking, or straight)
      (a) With arms
      (b) Upholstered
      3) Portable stage risers for band and/or choral groups
      4) Lectern with lamp
2. Considerations
   a) Student seating
      1) What portion of the time is the auditorium used?
      2) Who uses the seats: students and/or townspeople?
      3) Do the units shown signs of damage or wear?
      4) Is it easy to clean the auditorium?
      5) Is the auditorium put to supplemental use? If so, for what?
   b) Stage furniture
      1) Is it practical, both for use and for storage?
      2) Does it help provide proper atmosphere? ■

Elements of the Functional Classroom Environment

AMO DE BERNARDIS and VICTOR DOHERTY

Dr. De Bernardis (left) is assistant superintendent and Dr. Doherty, director of research for Portland Public Schools.

A check list for the design and equipment of the classroom, the place where the presence of appropriate physical facilities and adequate, well organized space will pay educational dividends.

It is often stated that the most important factor in the quality of education is the teacher, and this hardly can be gainsaid. But placing a teacher in a sterile, inadequate physical setting is as senseless and wasteful as training a skilled mechanic and permitting him to work with only a few of the tools he has mastered.

The classroom itself is the place where the presence of appropriate physical facilities and adequate, well-organized space will pay the richest educational dividends. This fact is often overlooked by planners of school buildings, who may devote more attention to planning special rooms and facilities than to planning the classroom itself.

What are the major elements of a functional classroom environment? Briefly, they include space, storage, heating, ventilation, acoustics, visual environment, electrical service, and equipment and facilities. To assist school personnel in the thorough and thoughtful planning of the most important room in the school, the following check list of classroom physical facilities has been prepared. It should be noted that some items apply only to primary and elementary grade classrooms.

Many further suggestions could be made regarding the design and equipping of a classroom so that the education of the teacher may be fully applied in the practice of teaching. Any classroom that scores high on the check list below should receive a strong vote of confidence from the teacher who uses it.

Space

Through flexible arrangements, is space available for:

- minor construction activities
- science experiments
- grouping
- indoor play (primary)
- art
- singing
- viewing
- large and small group listening to tapes and records

Is space provided for:

- teacher office and conference area
- materials preparation area
- special equipment (TV sets, aquariums, portable science labs, foreign language or music listening stations)

Storage

Has storage been provided for:

- classroom library books and periodicals
- maps, globes, charts, pictures
- science equipment and supplies
- projection devices
- construction tools
- expendable supplies
- records and tapes
- filing space
- semi-completed and completed student projects
- clothing

Storage

Is storage:

- adjustable for general uses
- specially designed for fixed special uses
- flexible (movable) when different room arrangements are required for different activities
- appropriately located for ease of use
- designed to facilitate and encourage good housekeeping on the part of students and teacher

Heating and ventilating

Have provisions been made for:

- controls that insure a constant comfortable room temperature under varying room uses, such as study, use of listening stations, indoor play (primary)
- ventilation when room is darkened for projected materials
- cooling as well as heating
- noise-free operation of ventilating system
- noise-free operation of heating system

Acoustics

Is provision made for:

- minimizing such noise as is created in construction activities, singing, etc.
- proper acoustical treatment so teacher may easily be heard at normal voice and ambient environmental noise levels
- proper acoustical qualities for use of audio devices (tape recorders

(Concluded on page 40)

1,706,400 children on one school bus?

Yes. That's how many passenger trips a 79-passenger Marmon-Herrington Specialized School Coach can make for you during its lifetime. Almost three times as many as a conventional 60-passenger bus under the most favorable conditions. And it will carry a total payload of $213,300.00 against $81,000.00 for the conventional unit, based on the national average expenditure of $45.00 per pupil per year.

This is possible only with the high performance engineered into the Marmon-Herrington Specialized vehicle. Performance that has to be built in from the ground up, and is practically impossible to achieve in any combination of body on chassis from two different manufacturers. Performance that means speed, maneuverability and ease of operation.

In a school transportation system this performance gives you the ability to move more pupils in a shorter time. In fact, a Marmon-Herrington coach can easily glide through four trips while a conventional bus, or even another transit-type bus, is grinding through three. Fewer buses do the same total job—which means savings in drivers' and mechanics' salaries, and in maintenance costs. These savings alone can amount to as much as 25% of your present school transportation budget.

Marmon-Herrington offers also the expert technical assistance to help you realize the full potential savings possible with the Marmon-Herrington Specialized School Transportation Coach, up to and including recommendations for the organization and operation of a complete system.

For a quick, conservative analysis of the savings possible to you, fill in and mail the coupon today.

MARMON-HERRINGTON COMPANY, INC., INDIANAPOLIS, INDIANA

M·H *System*

The Marmon-Herrington System for better, safer and more economical school transportation

Gentlemen: Please send information on the Marmon-Herrington System and a quick analysis of possible savings in my transportation system.

Name

School, District or County

Address

City State

No. of vehicles now in use No. of routes

Vehicle sizes (passengers)

Longest route miles No. Pupils transported

(For more information from advertisers, use postcard on page 45)

Can the Impacted Areas Program Carry General Aid to Victory?

ELAINE EXTON

Before adjourning, Congress voted a straight two-year extension of the federally impacted areas laws (P.L. 815 and 874) and the National Defense Education Act of 1958 (P.L. 85–864) without substantive change. The new measure continuing the expiring provisions of these Acts was signed into law by President Kennedy on October 3, 1961, "with extreme reluctance."

Representative Adam Clayton Powell (D., N. Y.), the Chairman of the House Education and Labor Committee, estimated these two-year authorizations would cost about $897,992,000 ($402,-992,000 for the federally affected areas program and $495,000,000 for the NDEA activities).

Conspicuously absent from this public school assistance package was the $2.3 billion program of general support for public grade and high schools which the Kennedy Administration had tried vainly to ride to victory on the back of the well-accepted program of federal aid for school districts with heavy concentrations of military personnel and others living or working on federal property.

At stake in this federal impact legislation were provisions for the education of two categories of children: The "B Category" whose parents either work or live on federal property and the "C Category" whose parents are employed by companies primarily engaged in federal contracts. Authorization for assistance for the "A Category" children whose parents both live and work on federal property was made permanent in 1958 (Public Law 85–620).

General Aid Maneuvers

An unusual aspect of this year's fight to get the principle of broad general federal financial support for public schools on the statute books was the maneuvering to use the popular impacted areas program, which puts money into about 316 of the 437 Congressional Districts, as a lever to force favorable Congressional action on general federal aid proposals.

A sharp division of opinion developed on the question of whether the type of assistance given to school districts under P.L. 815 and 874 is payment in the nature of lieu of taxes for federal holdings which cannot be taxed locally or is actually federal aid as that term is generally understood.

Said Congressman John E. Fogarty (D., R. I.): "I believe (federal impact legislation) is right in principle. It is based on the concept that the Federal Government as the Nation's largest real property owner — over 750 million acres of tax-exempt property — should make payments in the nature of in-lieu-of-tax payments, for the support of free public education in those school districts in or near which its property holdings are located — thus accepting the role of a local property taxpayer in support of these essential educational services."

On the other hand, Representative Frank Thompson, Jr. (D., N. J.) claimed "Public Laws 815 and 874 are in fact, and to a very large extent federal aid to education. To the full extent to which the moneys received by impacted districts exceed the actual loss in ratables, you have federal aid to education. . . .

"There can be no other assumption, there can be no other hypothesis except to take this bill (H. R. 9000) today as a proposition that this is federal aid to education. . . . By this action today in extending for 2 years help to those now covered by P.L. 815 and 874, we are discriminating against all those not covered; those who must attend schools on part-time sessions in classrooms which are totally inadequate; those who are taught by poorly paid teachers."

Senator Lee Metcalf (D., Mont.), another prominent federal aid proponent, also said of the impacted areas legislation: "Of course it is a general school aid bill." Remarking that this money even goes to pay the janitor and to buy the chalk, he noted that "under Public Law 874, the local (school) district comes directly to the Office of Education and makes applications direct to that office for money that is to be used for textbooks and teachers' salaries and for the operation and maintenance of schools."

President Kennedy's Proposal

Although the federal impact legislation had been considered separately and on its own merits in the past, breaking this precedent the Kennedy Administration combined in a single measure their new proposals for general school aid with their recommendations for making permanent the payments for the "B Category" of children in federally affected areas at a reduced rate (H. R. 4970 and S. 1021 as originally introduced).

This tactic drew fire from many lawmakers. Representative Joel T. Broyhill (R., Va.) who represents a Washington suburb receiving substantial federally impacted area aid, said: The President "is indulging in legislative blackmail." He complained that in putting both school proposals in the same bill President Kennedy was trying "to force the proponents of impacted area funds to vote for over-all federal aid to schools (and in) that way hopes to get a bigger Congressional vote in favor of school aid." Otherwise, Representative Broyhill continued, "the conservative members of Congress would vote against it."

Nonetheless the Administration still clung to this course of using impacted areas laws as "frosting for the cake" even after the B and C Categories had expired on July 1 and after the House Rules Committee on July 18 had voted to table the three bills embodying the President's major education proposals.

After this defeat the President told his news conference: "My judgment is that the impacted school bill should be part of general public (school) assistance. That is the position of the Administration. Therefore, I am hopeful that the members of Congress who are anxious to secure the passage of this legislation should also recognize that we are not meeting our responsibilities if we merely pass the impacted area (bill), but we should pass them both together. That is what we are working to do."

These developments touched off fresh protests in Congress. Representative Peter Frelinghuysen, Jr. (R., N. J.), for example, termed the inclusion of impacted areas aid "a 'sweetener' aimed at swaying the votes of those who have doubts about the rest of the bill," and the Minority members of the House Education and Labor Committee dispatched a letter to Committee Chairman Powell deploring "the situation in which Democratic maneuvering has placed Public Laws 815 and 874."

Impacted-Areas Strategy

A variety of attempts were made to pry the impacted areas program loose from the general school aid measure and pass it separately. At least 30 bills were introduced for this purpose.

In the House, Representative Craig Hosmer (R., Calif.) filed a petition to discharge his bill (H.R. 5349) extending

the expiration dates for P.L. 815 and 874 for two years from the House Education and Labor Committee. This stratagem, intended to be used as a last resort, if no other way were found to handle the situation, never attained the 219 signatures needed to get it out of committee, as it became apparent other means would succeed in attaining this objective.

In the Senate, Republican lawmakers on at least four occasions sought to attach a rider providing for a 3-year extension of the federal impact laws to pending legislation.

Although all of these efforts failed of adoption, the number of supporting votes grew steadily larger. An amendment of Senator Everett M. Dirksen (R., Ill.) to add such a 3-year extension to the Labor-HEW Appropriations bill was tabled by a vote of 57 to 37 on the question of germaneness. Subsequently a motion to recommit this bill to the Senate Appropriations Committee with instructions to report it back with the Dirksen impacted areas amendment in it was tabled by 51 yeas to 40 nays.

Next Senator Karl E. Mundt (R., S. Dak.) proposed that the rules be suspended during consideration of the Defense Department's Appropriations bill so he could offer an amendment to continue aid to schools crowded by children of federal employees. This lost by a vote of 47 to 37. Later, on August 18, he sought to attach a similar rider to the foreign aid bill, but was blocked by a vote of 51 to 40.

A Change in Tactics

After these defeats the tactics of the Administration's general school aid strategists changed. First, they proposed, and the House refused to consider by a stunning 242 to 169 vote, a stripped-down compromise package with general school construction aid for "impoverished" school districts imbedded as part of the federally impacted areas program.

The most zealous supporters of broad-scale public school assistance still were loath to let go of the popular impacted areas legislation as a means of achieving general federal aid. Whereas at first they had sought to use it as a whip to try to drive through broad purpose school-aid provisions, they then used it as a whipping boy in order to hold its extension down to 1 year so as to have the impacted areas legislation available as "green stamps" to help pass a general federal aid to education measure in 1962.

In a last-ditch attempt "to save minimal education for this year of Congress," Representative Adam Clayton Powell, the House Education and Labor Committee Chairman, called up a bill (H.R., 9000) to simply extend for two years the "time-tested and proved" impacted areas laws and National Defense Education Act. This was done on a Suspension-of-The-Rules-Day whose procedures limiting debate to a total of only 40 minutes, barring floor amendments, and requiring a two-thirds vote for adoption on this occasion abetted passage. The vote of approval was 378 to 32.

During the House consideration of H.R. 9000[1] the new general aid tactics came into view during the debate and as such previously loyal supporters of impacted areas aid as Representative Edith Green (D., Ore.) and Representative James Roosevelt (D., Calif.) voted against the 2-year extension in the Powell compromise.

Congresswoman Green urged "the defeat of this legislation, not because I am opposed to federal aid for our schools — but rather because I am convinced of the desperate need of an adequate program, a better program, carefully worked out, carefully considered and designed to meet the challenge of the space age in a more comprehensive way."

Explaining his preference for a 1-year extension of the measure providing aid for school districts burdened by federal activities, Representative Roosevelt pointed out that "both President Eisenhower and President Kennedy have each said this act also needs amendment, yet here we are going ahead with the same bill exactly as it is." He maintained the Federal Government no longer has such a responsibility in many "where the need no longer exists or which are no longer impacted."

While some lawmakers favored a 1-year continuation which would permit considering the general aid to education issue in the next Congressional session in the belief that a more substantial program would have a better chance in a Congressional election year, others like Representative Peter H. Dominick (R., Colo.) were of the opinion that "extending these activities for 2 years instead of one should reduce election pressures in later consideration of education legislation." He further stressed that "extending (these) relatively non-controversial programs should eliminate the practice of using them as sweeteners for other legislation which might be otherwise unacceptable to many Members."

The Senate Debate[2]

When the House-passed Powell bill to extend the expiring provisions of the impacted areas and National Defense Education laws for an additional two years (H.R. 9000) reached the Senate it was routed to the Senate Committee on Labor and Public Welfare, and the Senate considered instead a bill to continue impacted areas aid for one year (S. 2393) which this committee had approved a month earlier at a time when the fortunes of a more comprehensive program seemed at low ebb.

Senator Wayne Morse (D., Ore.) who had lead a successful fight earlier in the session against the Administration's proposals restricting impacted areas assistance now lashed this program with cutting arguments in a determined drive to limit the extension of Public Laws 815 and 874 to one year so there might be opportunity then to make this activity "an integral part of a coherent program of federal aid for school construction and teachers' salaries," as he put it.

Pleading for a bill "which will benefit all the children of the country, not merely the one-third of the children who are now being benefited under Public Laws 815 and 874," he said, "I favor helping all of them with complete guarantees of local control, because many school districts which really need the money are definitely child impacted areas, although they do not have any federal installations anywhere near them."

Senator Morse contended that a 1-year extension would provide time for the Department of Health, Education, and Welfare and the Comptroller General to "present (additional) studies which will tell us where the maladministration is or what changes are needed in the laws and where the undeserved payments, if any, are going." He stressed it would be unwise to freeze the present situation into the laws unchanged for another 2 or 3 or 4 years.

For a while it appeared that the supporters of general federal aid might stage a filibuster in order to stave off enactment of a 2-year extension of the NDEA and impacted areas programs. Then Senator Mike Mansfield (D., Mont.), the Majority Leader, produced a somewhat lukewarm letter from the President stating in part: "In my judgment a one year extension of school aid for impacted areas and the National Defense Education Act provide the best assurance that re-evaluation of legislation affecting education will take place early next year."

The general aid proponents then abandoned plans for a prolonged debate seemingly in the belief that the President's message and appeals to party loyalty would swing the necessary votes for a 1-year extension to their side.

The most telling rebuttal to the 1-year argument was made by Senator Mike Monroney (D., Okla.) in justifying his own amendment to substitute the verbatim text of the House-passed 2-year extension of the impacted areas and NDEA laws (H.R. 9000) for the bill before the Senate (S. 2393) to continue aid to federally impacted schools for a single year.

Reminding that "the same committee which today is urging a 1-year extension of the law, in May urged a 3-year extension (which) was put in as a part of the omnibus (education) bill," he emphasized, "now we are told we should not extend the law for more than 1 year, even at the risk of losing the program by not being able to get a conference with the House" (in the closing days of this session of Congress). "The whole argument," Senator Monroney said, "comes down to this: Shall we endanger these programs in an effort to use them as carrots to lead the reluctant Congressional mule to accept a general

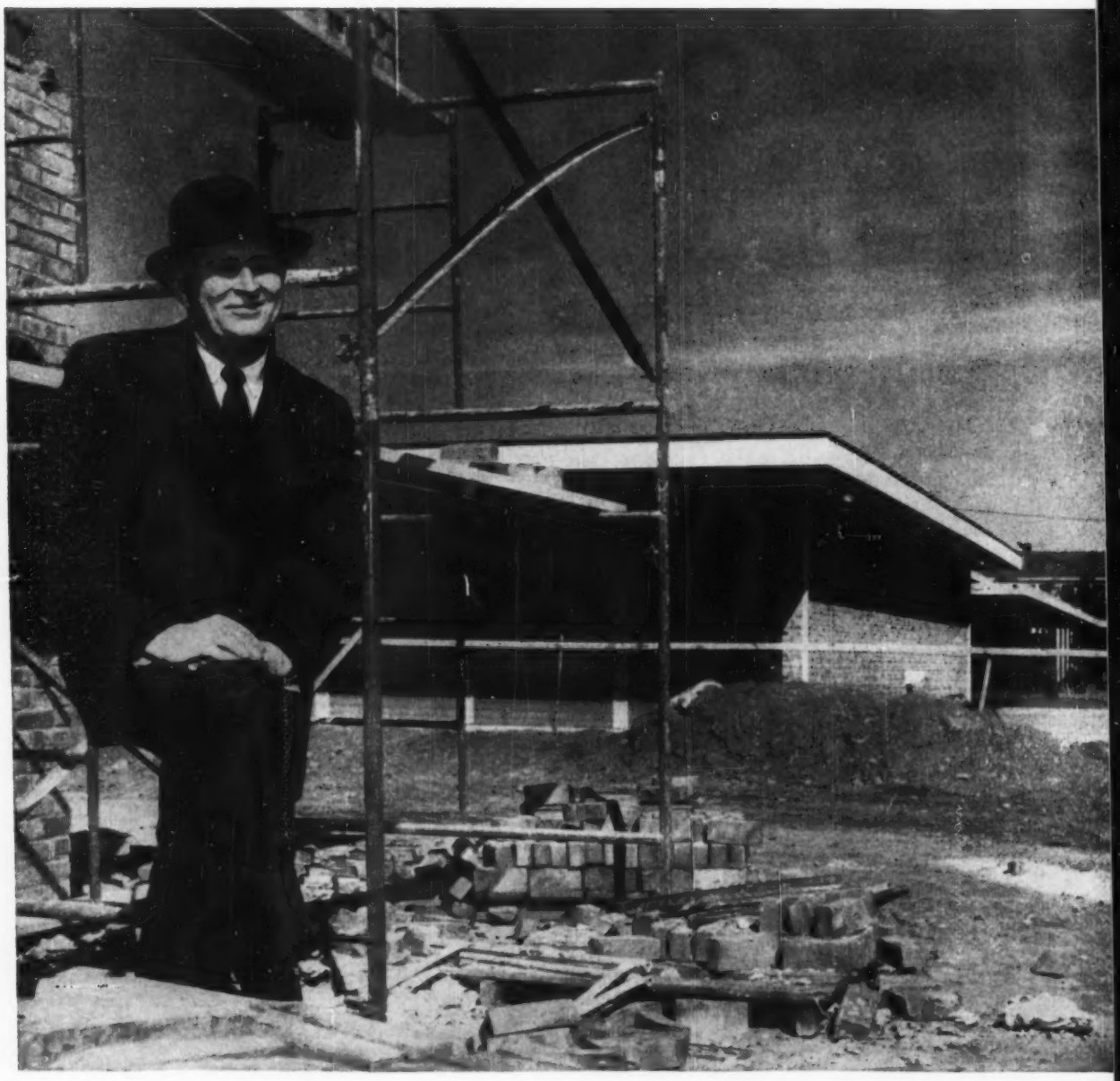
(Concluded on page 41)

[1] *Congressional Record*, Sept. 6, 1961, pp. 17095-17108.

[2] *Congressional Record*, Sept. 11, 1961, pp. 17746-17814, and Sept. 12, 1961, pp. 17826-17910.

Mr. Alexander C. Stevens, Superintendent,
Fremont Union High School District,
Sunnyvale, California, says:

"Honeywell proved to us air conditioning,



Superintendent Stevens on an inspection tour of the newest construction in the Fremont Union High School District.

(For more information from advertisers, use postcard on page 45)

that schools can be built with at no extra cost"

ARCHITECT: *Masten, Hurd & Gwatney, San Francisco*
MECHANICAL ENGINEER: *Keller & Gannon, San Francisco*
MECHANICAL CONTRACTOR: *Di Duca Bros., Inc., Los Gatos*

In any locale, the economies of including air conditioning in initial construction can offset its cost. And, students and teachers alike enjoy a better climate for learning.

"Our school district has to build one new school every year for the next nine years," Mr. Stevens said. "And we must be certain that we can use our schools effectively all year round. Particularly since our summer school enrollment gets larger each year. The only way we could assure a useful, year-round climate for learning was to include air conditioning. We were especially pleased when Honeywell showed us how we could enjoy central air conditioning without increasing the cost of the schools."

The Fremont Union High School District proves once again that air conditioning pays for itself. When architects and engineers are allowed to use this new technology they are able to design an air conditioned building that assures maximum educational use. As a result, costs are no higher than for a conventional building. And it is expected that the cost of operating the system will pay for itself through reduced cleaning, painting and decorating costs.

Your school will benefit from Honeywell temperature controls. Their accuracy and dependability assure you of the best environmental conditions for learning and the highest possible return on your investment in heating and air conditioning. Honeywell will work with your architect, consulting engineer or air conditioning contractor from planning stage to completion. For the informative booklet, "You can air condition your new school—and cut building costs," use the convenient coupon on this page.

HONEYWELL INTERNATIONAL
Sales and service offices in all principal cities of the world. Manufacturing in the United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

Honeywell

H HONEYWELL *First in Control*

SINCE 1885

MAIL TO: HONEYWELL, DEPARTMENT AJ 11-61
MINNEAPOLIS 8, MINNESOTA

Please send me the booklet, "You can air condition your new school—and cut building costs."

NAME _____

TITLE _____ SCHOOL _____

ADDRESS _____

CITY _____ STATE _____

(For more information from advertisers, use postcard on page 45)

the editorial stand

KEEP YOUR HEADS AND SAVE YOUR HIDES

WHEN we recall that in six years of World War II all the allies, including Russia, dumped about 7,000,000 tons of T.N.T. on Germany, we begin to get some idea of the destructive power of a 20 megaton hydrogen bomb — a megaton has the blast equivalent of a million tons of T.N.T. The 20 megaton bomb has 1000 times the blast power of the 20,000 ton bomb, the larger bomb dropped on Japan in 1945.

When, in an air burst, we exploded our first American 20 megaton bomb, it excavated a crater a mile and a half across to an average depth of some 170 feet. A single weapon of this power will smash the largest American city. It will kill directly by blast, by primary radiation, and by resultant fire storms in materials not pulverized. In American metropolitan centers the loss of a million lives would not be unexpected. Those who dwell in large cities have the greatest vulnerability to direct attack; and if attack comes, most of them are likely to die almost before they know what hit them. They will incur the greatest jeopardy, they will be the first and heaviest casualties. American cities have few shelters in which people could survive under a direct hit of a bomb of this type. And chairman Khrushchev says that his arsenal contains a super weapon — a bomb with the equivalent power of blast of 100,000,000 tons of T.N.T.

If a hydrogen bomb is exploded, the immediate disaster will not end miles away from the stricken target at the outer perimeter of the area of light damage from blast and primary radiation.

In digging its monstrous crater the H-bomb will send skyward to great heights millions of tons of pulverized materials. A small amount of this mushrooming cloud will consist of radioactive particles of the bomb itself. The greater part of it will be composed of fragments of earth, building materials, yes, and people — everything, all contaminated with radioactivity. This poisoned mist which slowly loses its radiation power will be raised to great heights, and then borne along on gales created by the blast itself and on prevailing winds. It will slowly drift earthward. About a half hour will elapse before this lethal powder will begin to fall in the general area of the blast. How widely it will be dispersed, and when it arrives, if at all, in more distant places, will depend on the direction and speed at which it is carried away. Fallout from a single blast will probably be scattered in dangerous concentrations over thousands of square miles. If simultaneous thermonuclear attacks are made on many targets, fallout may blanket the entire nation at once. If targets are attacked in succession, it may threaten first one area, then another.

The Danger of Fallout

Now let's say it: fallout is noxious, it has the power to burn, to injure, to kill. No person has immunity against it; and no area of the country is so removed from a major target as to be safe from its threat. Time was when dwellers in small cities and the open country could be smugly serene knowing that their chances of being blasted with fragmentation or fire bombs, or being showered with lethal dust, were slim — sometimes to the vanishing point. "Let the big cities save their own skins," was the thought occasionally articulated in letters to newspapers or in legislative voting. It was near-sighted thinking, of course. If the big cities and key military targets are smashed, if a war is lost, everyone stands to lose property, liberties, life itself. Enslaved nations under the Russian heel offer painfully vivid cases in point. And it could happen here.

Speedier means of delivering nuclear weapons complicate the problem of radioactive fallout. A few years after World War II the 350 mile per hour prop bomber gave way to the 600 mile jet bomber. Now the intercontinental ballistics missile — the ICBM — lofts the weapon 100 miles or more into the nearly frictionless ionosphere, to seek its distant target at speeds of 12,000 to 15,000 miles an hour. Ten or 15 years ago most mainland target areas in America planned to evacuate great numbers of people into their hinterlands, in the six to twelve hours between the time the alert was sounded and the weapon arrived over the target. Now, at 12,000 miles per hour, mid-America is a half hour from Vladivostok, and a quarter hour from the northeastern extremity of Siberian Asia. The sea threatens to become another launching pad for nuclear submarines similar to our Nautilus, bearing nuclear weapons similar to our Polaris missile.

Responsibility of School Boards

During school hours more than a quarter of all Americans are in school, and it is the clear responsibility of school boards and administrators to look to their safety. To carry out that responsibility every school must have its civil defense program. In the event of thermonuclear war, every school in the nation will be in danger of being showered with fallout and must develop a program to meet this threat. Schools in the great target areas should know the added dangers they face, and tailor-make their own expanded programs. They should face all possible contingencies frankly and prepare for survival as best they can. Let us say bluntly that it is doubtful if any school building is so solidly and skillfully constructed as to be able to survive and protect its occupants from blast under a near or direct hit by an H-bomb. But it is also possible, as some authorities point out, that the enemy may feel that a successful attack on military targets alone will break our resistance, and that they will spare our cities from bombing to gain their wealth. In such event radioactive fallout from military targets may sift down on our other areas.

The good school civil defense plan — the short-range program to give immediate protection to school children and personnel — must everywhere provide some kind of program against radioactive fallout.

What else it can and must do will be indicated by a realistic survey of the dangers that threaten the community in which it is located. Certainly a high school standing at a rural crossroads, with no large city within a 50 mile radius is likely to be safe from a direct hit by an H-bomb. Somewhere along the line, local, state, regional, or national civil defense has much information to give to school people who want to face and solve these problems. School plans, of course, must be articulated with official civil defense plans at all levels.

In the past, many Americans — among them many school people — facing the threat of thermonuclear weapons, have erred by adopting attitudes at one or the other extreme. They have taken the counsel of presumption, and with optimism wholly unjustified by the facts have blandly assumed that no one would dare to start a thermonuclear war, and that all "would be well if only we understood one another." Such optimistic unrealism, leading to the abandonment or refusal to consider precautionary or defensive programs puts the nation and all its members, including school children, in jeopardy.

Or they have taken the counsel of despair, and with a pessimism equally unjustified by the facts, they have just as blandly assumed that while thermonuclear war might be inevitable, ways and means to survive attack offered so little promise of success as not to be worth the trying.

As the cold war warms into a possible shooting or hot war, school people should keep to the middle of the road, and keep their heads cool. If they do, they and the children who look to them for survival as well as education, have a much better chance of keeping their hides intact. ■

— William M. Lamers
Assistant Superintendent of Schools
Milwaukee, Wis.

"What we first learn,
we best ken."

[Scottish Proverb]

PREPARE STUDENTS NOW FOR THE BEST JOBS...WITH ROYAL ELECTRICS

Today's best jobs demand Electric experience. And you can prepare your students better to meet this demand by starting them with Royal Electrics.

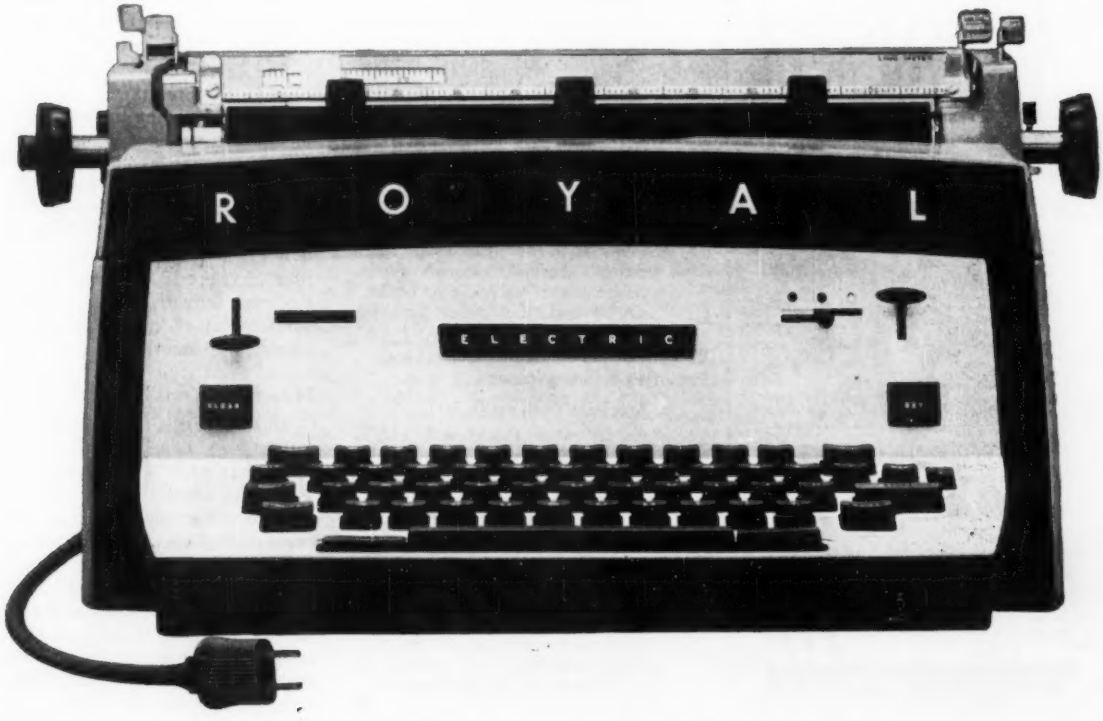
Royal's Electrics help your students get better results from the very beginning . . . help them advance faster.

The Royal Electric has more "fast learning" features than any other typewriter: Magic® Margin, Exclusive Touch Control® that simplifies the transfer from Manual to Electric, Carbon Ribbon-Fabric Ribbon, and Twin-Pak® Ribbon Changer®.

And Royal Electrics are rugged. At Royal, repair problems are considered before the machines are built . . . then designed out.

For help in planning your Electric Typewriter program, call your Royal Representative. For help in planning your Electric Teaching Program, write to us for booklets, Electric Typing Methods for the Teacher, and Electric Keyboard Mastery at 850 Third Ave., N. Y. 22, N. Y. Royal McBee Corporation.

ROYAL®
SPECIALISTS IN BUSINESS MACHINES



Superior Design, Construction and PERFORMANCE

far greater strength and SAFETY!

AMERICAN *Approved*

PLAYGROUND AND SWIMMING POOL EQUIPMENT

The wise choice of experienced buyers for nearly half a century.

WRITE FOR LITERATURE

AMERICAN
PLAYGROUND DEVICE CO.
ANDERSON, INDIANA, U.S.A.
WORLD'S LARGEST MANUFACTURERS OF FINE PARK, PICNIC, PLAYGROUND, SWIMMING POOL AND DRESSING ROOM EQUIPMENT

Veep
Quick Folding
PORTABLE
Coat and Hat Racks

Holds 72 coats and hats

Wheels as readily as a small service cart. The Veep rack unfolds into a rigid 6' 6" long unit holding 72 coats and hats. Scientifically counterbalanced so that it can be set up literally in seconds and fold down for storage as easily as an umbrella. Built of square tubular steel with double hat shelves of closed-end aluminum tubes supported by cast aluminum brackets. Plated to assure permanent beauty. Quality in engineering, construction and finish. The most efficient equipment yet developed for dining and meeting rooms, stand-by equipment, etc. . . . for wherever the "load" varies.

Write for Bulletin VP-206

Sets up with a sweep of the arms . . . in 2 or 3 seconds.

Wheels through ordinary doorways. 4' x 8' area stores racks for 720 people.

No. VP200 has rail for garment hangers.

No. VP300 has anchor coat hooks below hat shelf.

Made Only By VOGEL-PETERSON CO.
Rt. 83 and Madison St. • Elmhurst, Ill.

ELEMENTS OF THE FUNCTIONAL CLASSROOM

(Concluded from page 32)

motion picture projectors, TV, etc.)
. . . .minimizing transmission of sound between classrooms and other sound producing areas
. . . .quiet ballasts in fluorescent lights

Electrical service

Have outlets been provided for:
. . . .projection equipment
. . . .portable or permanent listening stations for individual and group use of records and tapes
. . . .portable or stationary science and construction equipment

Have provisions been made for:
. . . .control of room lighting through switch or dimmer systems
. . . .adequate capacity in electrical circuits
. . . .accessibility to raceways and conduits
. . . .easy expansion or alteration of electrical service
. . . .separate circuits for lighting and outlets
. . . .wall outlets located high enough to avoid dirt and floor wax, low enough to avoid inviting tampering by pupils
. . . .outlets above work surfaces
. . . .all outlets grounded

Visual environment

Has provision been made for:
. . . .light, soft, and pleasing room colors
. . . .elimination of glare from work surfaces
. . . .low light-dark ratios between walls, floors, ceilings, and furniture
. . . .good light diffusion by fixtures
. . . .control of both artificial and day light to accommodate such varied activities as reading, writing, and viewing motion pictures and other projected materials
. . . .elimination of light leaks when room darkened, through appropriate use of valances or baffles
. . . .simple and trouble-free pulls for shades, drapes, louvers

Facilities and equipment

Has provision been made for:
. . . .display area (tackboard, chalkboard)
. . . .sink and work surfaces
. . . .teacher file cabinet
. . . .interchangeable tackboards and chalkboards
. . . .equipment such as furniture, listening stations, TV sets, microprojectors, construction tools *selected specifically to enable the teacher to carry out the instructional objectives and courses of instruction of the particular district* ■

REDUCING THE TIME LAG IN EDUCATIONAL PROGRESS

(Concluded from page 11)

ness of a few basic principles. Any program built on these principles will be useful. Quite commonly, the principles will not be apparent in a cursory examination of the final operation.

Experimental Facts

Facts that can be demonstrated by a carefully designed experiment are often specific and minute. To establish a proof, they are studied within extremely specific limits and under carefully controlled conditions. The limits and the conditions can rarely be duplicated or maintained in the operational situation

Facts demonstrated under experimental conditions contribute to the development of theory from which principles emerge upon which operations may be based. Thus, the great need today is for the development of a systematic theory and a body of knowledge. From such a base there will be a flow of principles upon which practitioners can construct improved programs.

Program development is not the same as experimentation. It is concerned with larger units and has primarily an operational orientation. The goal of a developmental program is to produce a system of operation that will yield a known, definable product. The system may draw upon facts from many fields of science and from other sources.

The developmental program is quite close to the operational program. Even so, it may be based upon new elements or theories that are contrary to those accepted in the usual operation. When this is true, there is a danger that the new program will interfere with the established organization. For this reason, it is often desirable to have an institution developed to house the intermediate, formative step between the development of knowledge and the application of knowledge.

In Summary

While a part of the time lag in education must be recognized as an illusion, some of it is an immutable fact. There are several things that can be done to reduce the length of time between the discovery of knowledge and its application. A beginning is a posture of intent to change. This is followed by provisions for philosophy and prophecy and for an artificial aging of ideas. Finally, sound programs for research and development must be established to carry the idea into operation. ■

WORD FROM WASHINGTON

(Concluded from page 35)

federal aid to education bill next year?"

In the end the Monroney amendment prevailed. The test vote came when Senator Wayne Morse moved to modify Sanator Monroney's amendment by reducing the extension of Public Laws 815 and 874 from 2 years to 1 year. This proposal failed to carry by a vote of 40 to 45.

Senator Morse then submitted changes to reduce the duration of the National Defense Education Act extension in Senator Monroney's amendment from 2 years to 1. On a voice vote these failed of adoption. Finally, the Monroney amendment for a 2-year extension passed the Senate by a whopping 80 to 7 majority. This bill then went to the House where it was approved and sent to the President for his signature.

What do the Administration's efforts to link the extension of Public Laws 815 and 874 to the establishment of broad general aid for public schools portend for the future of the impacted areas program two years hence? The answer to this question was far from clear as this article went to press in early October.

Some federal aid supporters were quick to note that if general federal financing of public schools should pass, Public Laws 815 and 874 would not be needed in their present form. Other general aid backers viewed the existence of the impacted areas program as an obstacle to passage of broad-scale federal aid legislation which they thought would be easier to enact without it.

Still others were convinced from the experience this year that it would be a long time before general federal financing of education could be attained by a frontal approach. They considered a more appropriate way would be to graft a new category of public school construction assistance on to Public Law 815 as was proposed in the last-ditch compromise package of Secretary of Health, Education, and Welfare Ribicoff (H.R. 8890).

This compromise plan sought to amend Public Law 815 by adding a 1-year program of aid to "impoverished" school districts for constructing urgently needed school facilities.

Once such a provision has been in effect for a year or two, some of those favoring this route to general federal school support point out, a similar step can be taken by grafting a new category of aid for operating expenses onto Public Law 874. ■

RETARDED CHILDREN CAN BE HELPED

THE SCHOOL SCENE

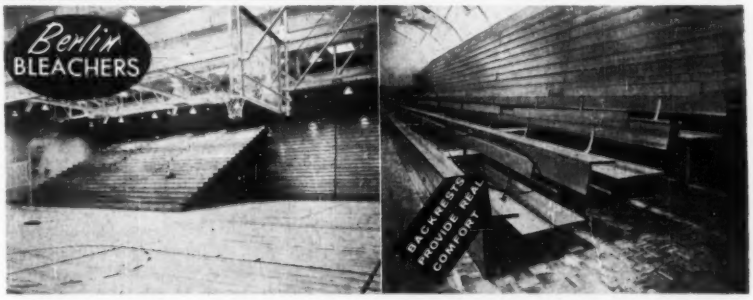
(Concluded from page 4)

and universities totaled 479,000, second highest mark in history, during the 1959–60 academic year, latest year for which figures are available.

The number of master's and second level degrees advanced 7 per cent over the preceding academic year, and the number of doctorates was up 5 per cent. At the bachelor's and master's levels, more degrees were conferred in education than in any other field.

Data now being collected for the 1960–61 school year indicates that the number of bachelor's degrees, which has increased for five consecutive years, may be exceeded again. New record-breaking totals of 78,000 in master's degrees and 10,500 in doctorates are tentatively forecast for 1960–61.

School bond sales for May, 1961, totaled $271,658,984, with leading sales of $62 million in Illinois, $53 million in California, $37 million in Pennsylvania, and $19 million in New York. The average municipal bond yield for 20 bonds as of June 22 was 3.53 per cent, compared with 3.46 per cent of May 25.



Spectator Seating ...FOR Multi-Sports EVENTS

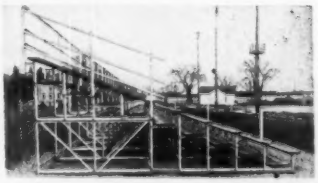
EZ-A-WAY Mechanical Folding Bleachers are preferred by schools throughout the country, because they are actually "in a class by themselves" . . . all custom-built to requirements. They are not stock items . . . extreme care is taken to insure that each installation is according to your specifications. The true "floating action" developed by Berlin Chapman Co. is an innovation that has never been successfully copied . . . other features — a slide arm bracket that assures ease in opening and closing . . . no exposed angles or nuts to mar shoes or scratch occupants. EZ-A-WAY Bleachers are offered in many combinations and arrangements.

EZ-A-WAY FOLDING BLEACHERS

- STANDARD • DELUXE
- MOBILE • OMEGA
- FORWARD FOLD GYM SEATS

BERLIN OUTDOOR SEATING ...

ALL-STEEL PORTABLE BLEACHERS — stationary and mobile . . . engineered and designed to provide maximum seating capacity — both indoors and outdoors . . . standard interchangeable sections that permit additions vertically and laterally to accommodate varying needs or situations . . . can be dismantled and re-erected in minutes, without skilled help. Also Aluminum Portable Bleachers that require no maintenance, no paint and are lightweight.



STEEL DECK GRANDSTANDS — three types of construction — Furnished with 2" x 10" select structural Douglas Fir seat boards. Alternate — All Aluminum Seat Boards — grandstands furnished with 10" wide all aluminum anodized seat boards. Alternate — grandstand furnished with (2) 2" x 6" select Structural Douglas Fir seat boards. Also Permanent Type Grandstands, available with roof structures.

Write for complete details and engineering data for your requirements.

BERLIN SEATING ENGINEERS BERLIN CHAPMAN CO. Berlin, Wisconsin U.S.A.

BERLIN CHAPMAN CO.
BERLIN, WISCONSIN

(For more information from advertisers, use postcard on page 45)

NEW PRODUCTS

SLIDING ACOUSTICAL WALL

Operable Wall, a new, sliding acoustical wall, permits classroom space to be adapted instantly to various needs. Developed by the E. F. Hauserman Co., Cleveland, Ohio, it is designed as a sound barrier. Rockwool-packed steel panels provide a double-wall effect. Continuous sealing at

Manually Operated

the perimeter and at all panel joints prevents sound leaks. Manually operated, the individually hung panels slide easily on a hanger assembly. Chalk or tackboard surfaces can be applied permanently. A baked on enamel finish never needs repainting. A 30-ft. section can be stacked in an area less than 2 ft. deep.

(For Further Details Circle Index Code 0184)

PLAYGROUND SAFETY MAT

Safety-Surf, a butyl rubber mat, is manufactured by Mitchell Rubber Products, Los Angeles, Calif. For use under playground equipment, the resilient mat absorbs the impact of a falling body, thus protecting

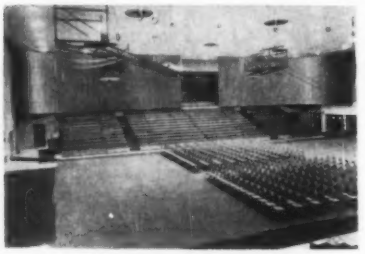
Interlocking Pieces

children from serious injuries. It comes in two ft. interlocking components, that can be assembled in almost any dimension required. Only the border and corner blocks are permanently secured to the ground or concrete. Assembly can be done by any untrained personnel.

(For Further Details Circle Index Code 0185)

GYM-WALL PARTITION

Power-operated Foldoor Gym-Wall partitions, by Holcomb & Hoke Mfg. Co., Inc., Indianapolis 7, Ind., has been installed in



Has Steel Inner Panels

Warren Central high school, Marion County, Ind. They close off two side balconies for girls' classes and other separate activities; they open to prepare the areas for maximum seating arrangement. Curved construction and power operation contribute extra flexibility and ease of use. Spanning openings 127 ft. long, these 20 ft. high partitions travel on curved track to a convenient stacking position against each end wall without the need of switches. Covered with vinyl fabric, the partition features two steel interliner panels which withstand rugged indoor athletic activities and reduce sound transmission. Send for details.

(For Further Details Circle Index Code 0186)

STORES CHAIRS WITH TABLE

The Midwest Du-Honey 112 portable folding table with its exclusive "piggy-back" storage feature helps to solve space.

"Piggy-Back" Storage

time, and dust problems. Manufactured by Midwest Folding Products, Roselle, Ill., this built-in storage rack holds 12 standard folding chairs in a vertical position and stores with the table. Once the table is loaded, the entire unit can easily be moved in and out of the multipurpose area. Write for complete information.

(For Further Details Circle Index Code 0187)

DESK THERMOSTAT

The Executstat, a new desk themostat by The Powers Regulator Co., Skokie, Ill., provides personal control of temperature environment. It occupies no more space than a conventional desk clock, and is meant for executive offices and conference rooms. The thermostat is pneumatically operated and readily adaptable to any space temperature control application. Its case is finished in white and light gray with silver knob.

(For Further Details Circle Index Code 0188)

READING IMPROVEMENT MACHINE

Craig Research, Inc., Los Angeles, Calif., has developed the Craig Reader, an automatic, pre-programmed reading improvement machine. With the use of the reader and the accompanying course material, reading speed will be at least doubled and comprehension will be greatly improved, according to the manufacturer. A variable

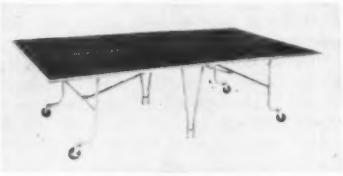
Reading Speed Is Doubled

electronic speed adjustment in the machine makes possible a reading range adjustment from 100 to 1000 words per minute. The complete 20-hour course material consists of 55 slides of 12 frames each, which are automatically fed into the reader at a selected speed. Durably constructed with high impact styrene plastic case, the portable reader weighs only 15 lb. It is designed for use by individuals or by two or three students who test at the same reading level. Send for complete details.

(For Further Details Circle Index Code 0189)

STURDY TENNIS TABLE

Mitchell Mfg. Co., Milwaukee 46, Wis., has designed a new professional type tennis table, with a counterbalance assembly that makes folding and unfolding easier. The table automatically locks when folded. "Twin-type" center legs of steel tubing



Fold-Up for Storage

tipped with rubber cushion glides give positive support on uneven floors. The playing surface is made of ¾ inch hardboard faced panels with plywood core, in standard non-reflective mat finish.

(For Further Details Circle Index Code 0190)

MEMORY TRAINING MACHINE

The MemoTutor is the first high-speed machine to enable persons to memorize factual information efficiently, according to the manufacturers, U. S. Industries, Inc., New York 17, N. Y. The student presses a keyboard to drill on uncertain items and to skip over those points easily memorized. Basic sets of information, such as multiplication tables, Morse code, etc., are available from the company, but the teacher can also transcribe his own programs by

Teacher Can Prepare Material

using a special paper ruled for typewriter spacing. The machine could be used for such drill as mathematic tables, science formulas and definitions, history dates, rules of grammar, etc. The company also produces a companion machine, the Auto-Tutor for information that can be presented logically or deductively.

(For Further Details Circle Index Code 0191)

SLIDEFILM PROJECTOR

The DuKane Corp., St. Charles, Ill., offers the new "AV-Matic" Sound-Slidefilm Projector, Model No. 14A285. A completely

No Need to Darken Room

automatic filmstrip projector uses 35mm. single frame filmstrip and 33⅓ rpm records up to 12 in. diameter. An optical and mirror system projects clear brilliant pictures on the 9 by 7 in. TV-style screen. Pictures are always in perfect focus and it is not necessary to darken the room. Picture changes automatically by means of an inaudible signal. A "Redi-Wind" system automatically rewinds the film. It comes in a scuff proof, vinyl bonded to aluminum case. It measures 15 by 13 by 18 in. and weighs 17 lb.

(For Further Details Circle Index Code 0192)

PORCELAIN CHALKBOARDS

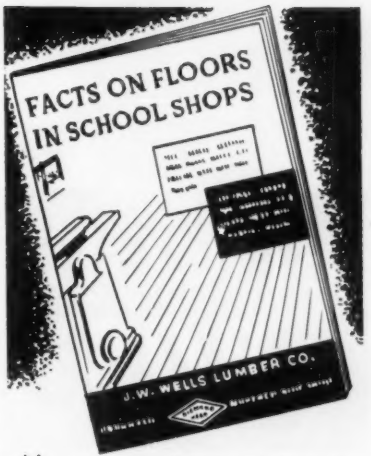
The Benjamin Porcelain Enameling Division of Thomas Industries, Inc., Louisville, Ky., makers of commercial lighting fixtures, has introduced a new lightweight porcelain enamel chalkboard. Guaranteed for the life of the building, the chalkboards are said to have greater scratch resistance and easier erasing qualities. A suede-like surface eliminates ghosting and chalk traps. The boards come in a variety of backing materials including foil backed Masonite, aluminum backed plywood, and Insulite. Sizes range from 36 to 48 in. high, in lengths up to 144 in. The acid resistant boards are available in pacific blue, charcoal gray, fawn tan, and medium and dark green.

(For Further Details Circle Index Code 0193)

SPEECH CORRECTION RECORDS

Four new speech correction records, employing both sight and sound method, are available from Speech Correction Record Series, Miami 38, Fla. The child can help himself to correct speech with a minimum of adult supervision. The equivalent of numerous lessons, the records have been prepared by an experienced speech therapist. Record 1 is "Correcting the Lisp" (45 rpm.); record 2 is "R Therapy," and records 3 and 4 "Therapy for Stuttering" (all 78 rpm.). Price is $3.98 each; or set of four, $15.

(For Further Details Circle Index Code 0194)



New, reliable, useful now, this is a summary of reports from superintendents of 57 major school districts on the kinds of floors they now have — floors they prefer, — for each of 8 major shop areas, woodworking, metalworking, printing, etc. (Survey made by Industrial Arts & Vocational Education Magazine, 1959.)

For courtesy copy, *WRITE* —

J. W. WELLS LUMBER CO.

Menominee 5, Michigan

Samsonite CHAIR BUYER'S GUIDE

SAMSONITE HAS IT *(the best chair for your multiple seating needs)*

Every chair has electrically welded tube steel construction (metal parts Bonderized to resist rust); chip-resistant baked enamel finish for long wear. Take your pick, and order now!

A. #2600. Steel folding chair in Bronze, Brown, Grey.

B. #6400. Luxurious Samsontex-upholstered stacking chair in Yearling Black, Yearling Tan, Yearling White.

C. #2650. PlastiShield folding chair in Counterpoint Tan, Counterpoint Grey.

D. #1700. Vinyl-upholstered folding chair in Contract Brown, Counterpoint Grey, Counterpoint Tan, Counterpoint White and Gala Blue.

E. #1200. Folding arm chair; Samsontex vinyl-upholstered, in Contract Brown, Counterpoint Grey, Counterpoint Tan, Counterpoint White, Gala Blue.

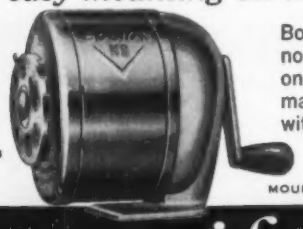
Find it Fast in the Yellow Pages

For church, school, club, other group seating information, see your Yellow Pages or write: Shwayder Bros., Institutional Seating Div., Dept. AJ111, Detroit 29, Mich.

Samsonite
FOLDING and STACKING CHAIRS

(For more information from advertisers, use postcard on page 45)

easy mounting on any surface



Boston sharpeners now can be mountec on wood, glass, masonry or steel without drilling holes

MOUNTING KIT

specify BOSTON® PENCIL SHARPENERS

guaranteed quality

The strong all-metal construction of Boston Pencil Sharpeners makes them last . . . Bases are guaranteed against breakage . . . There is a model for every need, and one mounting kit fits all models.

Send for catalog and price list.

C. HOWARD HUNT PEN CO., CAMDEN 1, NEW JERSEY

LOW COST INCINERATOR

BURNS TRASH SAFELY OUTDOORS

Only $110.00 COMPLETE

NO INSTALLATION COST

Burn wrappings, sweepings, papers, cartons, packing, rags, food waste, safely outdoors. Scientific draft control ends fire hazards of flying ash, sparks, burning blowing papers. Burns damp, green, or dry refuse to fine ash in any weather. Minimizes smoke and smell, needs no watching. Safe for use 10′ from buildings. Stands 52″ high x 35″ square at base. 10 bushel burning capacity. Complete with hinged hood, ash pan base and grate and cleanout door. Made of aluminized steel (molten aluminum bonded to steel) with replaceable inner steel panel construction for long life. Shipped assembled—weight 170 lbs. Only $110.00 F.O.B. Cleveland. Satisfaction guaranteed. Other sizes available.

Write for **FREE** *Folder*

ALSTO COMPANY

Dept. 18 4007 Detroit Ave. Cleveland 13, Ohio

CATALOGS AND BOOKLETS

A new bulletin, "Tele-Quest," explains a new television system that allows students to put their questions to the television instructor and receive answers via the classroom set. Send for a copy from **Community Engineering Corp.**, State College, Pa.

(For Further Details Circle Index Code 0195)

School administrator's edition (No. 112A) of the **Beckley-Cardy** School Buyer's Guide contains 200 pages of buying information on classroom seating, furniture, athletic equipment, supplies, teaching material, books and other material offered by the Chicago firm.

(For Further Details Circle Index Code 0196)

An 8-page illustrated color brochure details specifications on mobile classrooms available from **Fort Wayne Leasing Co., Inc.**, Fort Wayne, Ind. Mobile "trailer" units accommodate from 18 to 39 students.

(For Further Details Circle Index Code 0197)

Case history use of metal curtain walls is detailed in a new, 16-page illustrated color catalog available from **Albro Metal Products Corp.**, New York 59, N. Y.

(For Further Details Circle Index Code 0198)

Send for "Page Campus Fence," a new folder describing various styles of protective fencing for schools, institutions, playgrounds, and athletic fields, from **Page Steel and Wire Division**, of American Chain & Cable Co., Inc., Monessen, Pa.

(For Further Details Circle Index Code 0199)

Holophone Co., Inc., New York 17, N. Y., offers a new folder on "Indoor Sports Lighting for Educational Institutions." Send for a copy.

(For Further Details Circle Index Code 0200)

CORRESPONDING CODE INDEX NUMBERS TO BE ENCIRCLED CAN BE FOUND ON THE CARDS IN THE READER'S SERVICE SECTION

with the same enthusiasm as this avid reader . . .

PREMIER

continually undertakes to give their best effort to every **photo engraving** with sensitivity and skill.

PREMIER ENGRAVING COMPANY
818 W. Winnebago Street
Milwaukee 5, Wisconsin
BRoadway 1-3337 . 3338 . 3339

(For more information from advertisers, use postcard on page 45)

READER'S SERVICE SECTION

INDEX TO SCHOOL EQUIPMENT

The index and digest of advertisements below will help you obtain free information, catalogs, and product literature from the advertisements and companies listed in the new product section. Merely encircle the code number assigned to each firm in the request form below, clip the form and mail it to THE AMERICAN SCHOOL BOARD JOURNAL. Your request will receive prompt attention.

Code No.		Page No.
1110	**Acme Chemical Co.** ..... Maintenance supplies	4
1111	**Alsto Company** ..... Low cost incinerator	44
1112	**American Playground Device Company** ..... Playground and swimming pool equipment	40
1113	**Berlin Chapman Company** ..... Folding bleachers	41
1114	**Dearborn Chemical Co.** ..... Water treatment development	1
1115	**Hillyard Chemical Company** .... Maintenance supplies	8
1116	**Hunt Pen Co., C. Howard** ..... Pencil sharpeners	44
1117	**Johnson Service Company** ....Temperature controls	6 & 7
1118	**Marmon-Herrington, Inc.** ..... School bus bodies	33
1119	**Minneapolis-Honeywell Regulator Company** ..... Temperature controls	36 & 37
1120	**Nissen-Medart Corp.** .... Gymnasium apparatus	3rd cover
1121	**Owens Illinois: Kimble Glass Company** ..... Thinlite curtain wall	4th cover
1122	**Panelfab Products, Inc.** ..... Relocatable classrooms	2nd cover
1123	**Premier Engraving Company** ... Engravers	44
1124	**Royal Typewriter Company, Div. Royal McBee Corp.** ..... Electric typewriters	39

USE THESE CARDS

These cards are provided for the convenience of THE AMERICAN SCHOOL BOARD JOURNAL readers in requesting information on products, services, booklets, and catalogs offered by the advertisers in this issue.

November, 1961

THE AMERICAN SCHOOL BOARD JOURNAL
400 North Broadway, Milwaukee 1, Wis.

Please ask the manufacturers, whose code numbers I have encircled, to send me the information, catalogs, or product literature offered in this issue.

ADVERTISING INDEX

1110 1112 1114 1116 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129
1111 1113 1115 1117

NEW PRODUCTS — CATALOGS AND BOOKLETS

0184 0186 0187 0188 0189 0190 0191 0192 0193 0194 0195 0196 0197 0198 0199 0200
0185

Name_____ Title_____

School_____

Address_____

City_____ Zone____ State_____

HAVE YOU SIGNED YOUR NAME AND ADDRESS?

November, 1961

THE AMERICAN SCHOOL BOARD JOURNAL
400 North Broadway, Milwaukee 1, Wis.

Please ask the manufacturers, whose code numbers I have encircled, to send me the information, catalogs, or product literature offered in this issue.

ADVERTISING INDEX

1110 1112 1114 1116 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129
1111 1113 1115 1117

NEW PRODUCTS — CATALOGS AND BOOKLETS

0184 0186 0187 0188 0189 0190 0191 0192 0193 0194 0195 0196 0197 0198 0199 0200
0185

Name_____ Title_____

School_____

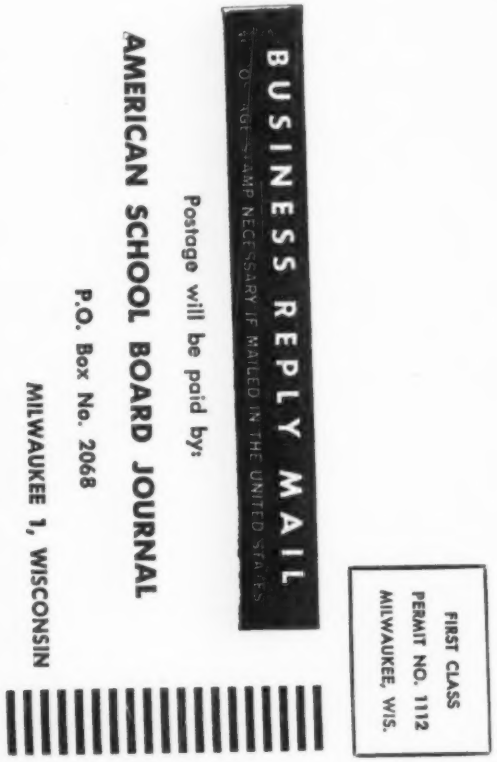
Address_____

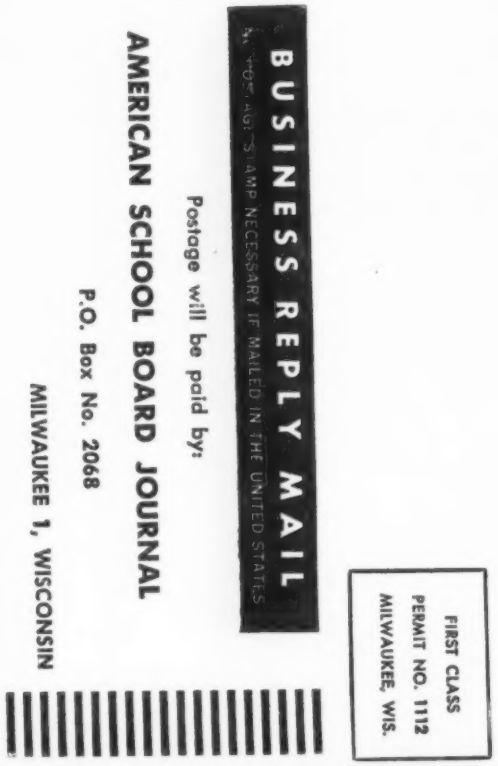
City_____ Zone____ State_____

HAVE YOU SIGNED YOUR NAME AND ADDRESS?

USE THESE CARDS

The cards below are for your convenience in requesting product information, catalogs, and literature from advertisers and firms listed in this issue.


BUSINESS REPLY MAIL
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES
Postage will be paid by:
AMERICAN SCHOOL BOARD JOURNAL
P.O. Box No. 2068
MILWAUKEE 1, WISCONSIN
FIRST CLASS
PERMIT NO. 1112
MILWAUKEE, WIS.


BUSINESS REPLY MAIL
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES
Postage will be paid by:
AMERICAN SCHOOL BOARD JOURNAL
P.O. Box No. 2068
MILWAUKEE 1, WISCONSIN
FIRST CLASS
PERMIT NO. 1112
MILWAUKEE, WIS.

READER'S SERVICE SECTION

(Continued)

Code No.		Page No.
1125	**Ruud Manufacturing Co., Div. Rheem Mfg. Co.** Gas water heater	5
1126	**Shwayder Brothers, Inc.** Folding and stacking chairs	43
1127	**Underwood Corp.** Electric typewriters	2
1128	**Vogel-Peterson Co., Inc.** Portable coat and hat racks	40
1129	**Wells Lumber Co., J. W.** Facts on school shop floors	43

NEW PRODUCTS

0184	**E. F. Hauserman Co.** Sliding Acoustical Wall	42
0185	**Mitchell Rubber Products** Safety Mat	42
0186	**Holcomb & Hoke Mfg. Co.** Gym-Wall Partition	42
0187	**Midwest Folding Products** "Piggy-back" storage	42
0188	**Powers Regulator Co.** Desk Thermostat	42
0189	**Craig Research, Inc.** Reading Improvement Machine	42
0190	**Mitchell Mfg. Co.** Tennis Table	42
0191	**U. S. Industries, Inc.** Memory Training Machine	43
0192	**DuKane Corp.** Slidefilm Projector	43
0193	**The Benjamin Porcelain Enameling Division of Thomas Industries, Inc.** Porcelain Chalkboards	43
0194	**Speech Correction Record Series** Speech Records	43

CATALOGS AND BOOKLETS

0195	**Community Engineering Corp.**	44
0196	**Beckley-Cardy**	44
0197	**Fort Wayne Leasing Co., Inc.**	44
0198	**Albro Metal Products Corp.**	44
0199	**Page Steel and Wire Div.**	44
0200	**Holophone Co., Inc.**	44

GYMNASTIC APPARATUS IN LIFETIME CHROME

Compare today's car with those of the 1920's. Quite a difference? That's just what you'll see when you compare Nissen Medart's new Chrome line with other gymnastic apparatus. Gleaming, maintenance-free chrome finish, lightweight oval-shaped steel tubing construction (in place of cast iron), finger tip adjustment, easy portability, and traditional Nissen Medart performance make the new Chrome line a lifetime investment for today's schools. This American made gymnastic apparatus conforms to Olympic specifications. Can you afford to buy anything less when it costs no more than ordinary gymnastic apparatus?

NISSEN MEDART CORPORATION, CEDAR RAPIDS, IOWA

World's Largest Manufacturer of Gymnasium Apparatus

(For more information from advertisers, use postcard on page 45)

Prefabricated in modular units . . .

installed quickly and easily

Light and cheerful inside, yet no glare . . . thanks to Thinlite

Thinlite curtain wall improves learning environment ...increases visual and thermal comfort at low cost

Glare-free, diffused daylight contributes to better environment for learning. Solar-selecting panels of Thinlite curtain walls are scientifically designed to distribute harsh sunlight softly and evenly throughout classrooms . . . for superior seeing and reading comfort. Expensive shading devices are not required.

Solar-selecting Thinlite panels minimize solar heat . . . actually are double glazed . . . to help control interior temperatures all year long . . . for low-cost physical comfort.

Important in curtain wall construction is the weather-tight permanence which Thinlite assures, due to its double gasketing system.

And, Thinlite requires little maintenance in providing a permanent, beautiful exterior surface, inside your classrooms as well as on the exterior of your school building.

Ask your architect about the infinite variety of design possibilities with Thinlite. Or, write to Kimble Glass, subsidiary of Owens-Illinois, Toledo 1, Ohio for complete information.

THINLITE CURTAIN WALL
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO